

WARF0235.ST25.txt  
SEQUENCE LISTING

<110> Helgeson, John P.  
Austin-Phillips, Sandra  
Naess, Sara Kristine  
Song, Junqi  
Jiang, Jiming  
Bradeen, James Mathew  
Buell, C. Robin

<120> POTATO GENES FOR RESISTANCE TO LATE BLIGHT

<130> WARF-0235

<150> US 60/439,376

<151> 2003-01-10

<160> 125

<170> PatentIn version 3.2

<210> 1

<211> 2940

<212> DNA

<213> Solanum bulbocastanum

<220>

<221> CDS

<222> (1)..(2940)

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ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa	96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln	
20 25 30	
agg ctt tca agc atg ttt tct aca atc caa gcc gtc ctt gaa gat gct	144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala	
35 40 45	
caa gag aag caa ctc aac gac aag cct cta gaa aat tgg ttg caa aaa	192
Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys	
50 55 60	
ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa	240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys	
65 70 75 80	
act aag gcc aca aga ttc ttg cag tct gaa tat ggc cgt tat cat cca	288
Thr Lys Ala Thr Arg Phe Leu Gln Ser Glu Tyr Gly Arg Tyr His Pro	
85 90 95	
aag gtt atc cct ttc cgc cac aag gtt ggg aaa agg atg gat caa gtg	336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val	
100 105 110	
atg aaa aaa ctg aat gca wtt gct gag gaa cga aag aag ttt cat ttg	384
Met Lys Lys Leu Asn Ala Xaa Ala Glu Glu Arg Lys Lys Phe His Leu	
115 120 125	
caa gaa aag att ata gag aga caa gct gct aca cgg gaa aca ggt tct	432
Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser	
130 135 140	
gtg tta act gaa cca caa gtt tat gga agg gac aaa gaa aaa gat gag	480
Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu	

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145	150	155	160	
ata gtg aaa atc cta ata aac act gct agt gat gcc caa aaa ctc tca Ile Val Lys Ile Leu Ile Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser	165	170	175	528
gtc ctc cca ata ctt ggt atg ggg gga cta gga aag acg act ctt tcc Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser	180	185	190	576
caa atg gtc ttc aat gat cag aga gta act gag cgt ttc tat ccc aaa Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys	195	200	205	624
ata tgg att tgc atc tcg gat gat ttt aat gag aag agg ttg ata aag Ile Trp Ile Cys Ile Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys	210	215	220	672
gca ata gta gaa tct att gaa ggg aag tcc ctc agt gac atg gac ttg Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu	225	230	235	720
gct cca ctt caa aag aag ctt caa gag ttg ctg aat gga aaa aga tac Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr	245	250	255	768
ttc ctt gtc tta gat gat gtt tgg aat gaa gat caa cat aag tgg gct Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala	260	265	270	816
aat tta aga gca gtc ttg aag gtt gga gca agt ggt gca ttt gtt cta Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Phe Val Leu	275	280	285	864
act act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg caa Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu Gln	290	295	300	912
cca tat gaa ttg tca aat ctg tct cca gag gat tgt tgg ttt ttg ttc Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe	305	310	315	960
atg cag cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt atg Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Met	325	330	335	1008
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gcc aag act ctt gga ggt att ttg cgc ttc aag aga gaa gaa aga gaa Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu	355	360	365	1104
tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat gaa Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu	370	375	380	1152
agt tct att ctg cct gcc ctg agg ctt agt tac cat cat ctt cca ctt Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu	385	390	395	1200
gat ttg aga caa tgc ttt gtg tat tgt gcg gta ttc ccg aag gac acc Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr	405	410	415	1248
aaa atg gca aag gaa aat ctt atc gct ttc tgg atg gca cac ggt ttt Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe	420	425	430	1296

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Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val	
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tggt aat gaa tta tac ttg aggt tct ttc ttc caa gag att gaa gtt gaa	1392
Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu	
450 455 460	
tct ggt aaa act tat ttc aag atg cat gac ctc atc cat gat ttg gct	1440
Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala	
465 470 475 480	
aca tct ctg ttt tca gca aac aca tca agc agc aat att cgt gaa ata	1488
Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile	
485 490 495	
aat gct aat tat gat gga tat atg atg tcg att ggt ttt gct gaa gtg	1536
Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val	
500 505 510	
gta tct tct tac tct ccg tca ctc ttg caa aag ttt gtc tca tta aggt	1584
Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg	
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gtg ctt aat cta aga aac tcg aac cta aat caa tta cca tct tcc att	1632
Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile	
530 535 540	
gga gat cta gta cat tta aga tac ctg gac ttg tct ggc aat ttt aga	1680
Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Phe Arg	
545 550 555 560	
att cgt aat ctt cca aag aga tta tgc aag ctt caa aat ctg cag act	1728
Ile Arg Asn Leu Pro Lys Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr	
565 570 575	
ctt gat cta cat tat tgc gac tct ctt tct tgt ttg cca aaa caa aca	1776
Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr	
580 585 590	
agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggc tgt tca ttg	1824
Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu	
595 600 605	
aca tca acg cca cca aggt ata gga ttg ttg aca tgc ctt aag tct cta	1872
Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu	
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agt tgc ttt gtt att ggc aag aga aaa ggt cat caa ctt ggt gaa cta	1920
Ser Cys Phe Val Ile Gly Lys Arg Lys Gly His Gln Leu Gly Glu Leu	
625 630 635 640	
aaa aac cta aat ctc tat ggc tca att tca atc aca aaa ctt gac aga	1968
Lys Asn Leu Asn Leu Tyr Gly Ser Ile Ser Ile Thr Lys Leu Asp Arg	
645 650 655	
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Val Lys Lys Asp Thr Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys Ala	
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Asn Leu His Ser Leu Cys Leu Ser Trp Asp Leu Asp Gly Lys His Arg	
675 680 685	
tat gat tca gaa gtt ctt gaa gcc ctc aaa cca cac tcc aat ctg aaa	2112
Tyr Asp Ser Glu Val Leu Glu Ala Leu Lys Pro His Ser Asn Leu Lys	
690 695 700	
tat tta gaa atc aat ggc ttc gga gga atc cgt ctc cca gat tgg atg	2160
Tyr Leu Glu Ile Asn Gly Phe Gly Gly Ile Arg Leu Pro Asp Trp Met	

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gaa aac tgc tca tgc tta cca ccc ttt ggt gag ctg cct tgt cta gaa Glu Asn Cys Ser Cys Leu Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu		745	750	2256
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agt cta gag tta cac acc ggg tca gcg gat gtg gag tat gtt gaa gat Ser Leu Glu Leu His Thr Gly Ser Ala Asp Val Glu Tyr Val Glu Asp		760	765	2304
	755			
aat gtt cat cct gga agg ttt cca tcc ttg agg aaa ctt gtt ata tgg Asn Val His Pro Gly Arg Phe Pro Ser Leu Arg Lys Leu Val Ile Trp		775	780	2352
	770			
gac ttt agt aat cta aaa gga ttg ctg aaa atg gaa gga gaa aag caa Asp Phe Ser Asn Leu Lys Gly Leu Leu Lys Met Glu Gly Glu Lys Gln		790	795	2400
			800	
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			815	
att ccg acc ctt tct tct gtc aag aca ttg aaa gtt att gtg aca gat Ile Pro Thr Leu Ser Ser Val Lys Thr Leu Lys Val Ile Val Thr Asp		820	825	2496
			830	
gca aca gtt ttg agg tcc ata tct aat ctt agg gct ctt act tct ctc Ala Thr Val Leu Arg Ser Ile Ser Asn Leu Arg Ala Leu Thr Ser Leu		835	840	2544
			845	
gac att agc gat aac gta gaa gct act tca ctc cca gaa gag atg ttc Asp Ile Ser Asp Asn Val Glu Ala Thr Ser Leu Pro Glu Glu Met Phe		850	855	2592
			860	
aaa agc ctt gca aat ctc aaa tac ttg aaa atc tct ttc ttt agg aat Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys Ile Ser Phe Phe Arg Asn		870	875	2640
			880	
ctc aaa gag ttg cct acc agc ttg gct agt ctc aat gct ttg aag agc Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu Asn Ala Leu Lys Ser		885	890	2688
			895	
ctc aaa ttt gaa ttt tgt gac gca cta gag agt ctc cca gag gaa ggg Leu Lys Phe Glu Phe Cys Asp Ala Leu Glu Ser Leu Pro Glu Glu Gly		900	905	2736
			910	
gtg aaa ggt tta act tca ctc acc gag ttg tct gtc agt aac tgt atg Val Lys Gly Leu Thr Ser Leu Thr Glu Leu Ser Val Ser Asn Cys Met		915	920	2784
			925	
atg cta aaa tgt tta ccg gag gga ttg cag cac cta aca gcc ctc aca Met Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu Thr Ala Leu Thr		930	935	2832
			940	
act tta aca att act caa tgt cca ata gta ttc aag cgg tgt gag agg Thr Leu Thr Ile Thr Gln Cys Pro Ile Val Phe Lys Arg Cys Glu Arg		945	950	2880
			955	960
gga ata gga gaa gac tgg cac aaa att gct cac att cca tat ttg act Gly Ile Gly Glu Asp Trp His Lys Ile Ala His Ile Pro Tyr Leu Thr		965	970	2928
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cta tat gag tga Leu Tyr Glu				2940

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Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45

Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80

Thr Lys Ala Thr Arg Phe Leu Gln Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
 100 105 110

Met Lys Lys Leu Asn Ala Xaa Ala Glu Glu Arg Lys Lys Phe His Leu  
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Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser  
 130 135 140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
 145 150 155 160

Ile Val Lys Ile Leu Ile Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser  
 165 170 175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser  
 180 185 190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys  
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Ile Trp Ile Cys Ile Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys  
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Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu

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Phe	Leu	Val	Leu	Asp	Asp	Val	Trp	Asn	Glu	Asp	Gln	His	Lys	Trp	Ala
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Asn	Leu	Arg	Ala	Val	Leu	Lys	Val	Gly	Ala	Ser	Gly	Ala	Phe	Val	Leu
		275					280					285			
Thr	Thr	Thr	Arg	Leu	Glu	Lys	Val	Gly	Ser	Ile	Met	Gly	Thr	Leu	Gln
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Pro	Tyr	Glu	Leu	Ser	Asn	Leu	Ser	Pro	Glu	Asp	Cys	Trp	Phe	Leu	Phe
305					310					315					320
Met	Gln	Arg	Ala	Phe	Gly	His	Gln	Glu	Glu	Ile	Asn	Pro	Asn	Leu	Met
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Ala	Ile	Gly	Lys	Glu	Ile	Val	Lys	Lys	Cys	Gly	Gly	Val	Pro	Leu	Ala
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Ala	Lys	Thr	Leu	Gly	Gly	Ile	Leu	Arg	Phe	Lys	Arg	Glu	Glu	Arg	Glu
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Trp	Glu	His	Val	Arg	Asp	Ser	Pro	Ile	Trp	Asn	Leu	Pro	Gln	Asp	Glu
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Ser	Ser	Ile	Leu	Pro	Ala	Leu	Arg	Leu	Ser	Tyr	His	His	Leu	Pro	Leu
385					390					395					400
Asp	Leu	Arg	Gln	Cys	Phe	Val	Tyr	Cys	Ala	Val	Phe	Pro	Lys	Asp	Thr
				405					410					415	
Lys	Met	Ala	Lys	Glu	Asn	Leu	Ile	Ala	Phe	Trp	Met	Ala	His	Gly	Phe
			420					425					430		
Leu	Leu	Ser	Lys	Gly	Asn	Leu	Glu	Leu	Glu	Asp	Val	Gly	Asn	Glu	Val
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Trp	Asn	Glu	Leu	Tyr	Leu	Arg	Ser	Phe	Phe	Gln	Glu	Ile	Glu	Val	Glu
	450					455					460				
Ser	Gly	Lys	Thr	Tyr	Phe	Lys	Met	His	Asp	Leu	Ile	His	Asp	Leu	Ala
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Thr	Ser	Leu	Phe	Ser	Ala	Asn	Thr	Ser	Ser	Ser	Asn	Ile	Arg	Glu	Ile
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Asn	Ala	Asn	Tyr	Asp	Gly	Tyr	Met	Met	Ser	Ile	Gly	Phe	Ala	Glu	Val
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Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg  
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 Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile  
 530 535 540  
 Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Phe Arg  
 545 550 555 560  
 Ile Arg Asn Leu Pro Lys Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr  
 565 570 575  
 Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr  
 580 585 590  
 Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu  
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 Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu  
 610 615 620  
 Ser Cys Phe Val Ile Gly Lys Arg Lys Gly His Gln Leu Gly Glu Leu  
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 Lys Asn Leu Asn Leu Tyr Gly Ser Ile Ser Ile Thr Lys Leu Asp Arg  
 645 650 655  
 Val Lys Lys Asp Thr Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys Ala  
 660 665 670  
 Asn Leu His Ser Leu Cys Leu Ser Trp Asp Leu Asp Gly Lys His Arg  
 675 680 685  
 Tyr Asp Ser Glu Val Leu Glu Ala Leu Lys Pro His Ser Asn Leu Lys  
 690 695 700  
 Tyr Leu Glu Ile Asn Gly Phe Gly Gly Ile Arg Leu Pro Asp Trp Met  
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 Asn Gln Ser Val Leu Lys Asn Val Val Ser Ile Arg Ile Arg Gly Cys  
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 Glu Asn Cys Ser Cys Leu Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu  
 740 745 750  
 Ser Leu Glu Leu His Thr Gly Ser Ala Asp Val Glu Tyr Val Glu Asp  
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 Asn Val His Pro Gly Arg Phe Pro Ser Leu Arg Lys Leu Val Ile Trp  
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 Phe Pro Val Leu Glu Glu Met Thr Phe Tyr Trp Cys Pro Met Phe Val  
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 Ile Pro Thr Leu Ser Ser Val Lys Thr Leu Lys Val Ile Val Thr Asp  
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 Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys Ile Ser Phe Phe Arg Asn  
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 Val Lys Gly Leu Thr Ser Leu Thr Glu Leu Ser Val Ser Asn Cys Met  
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## WARF0235.ST25.txt

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Asn Leu Tyr Tyr Tyr Lys Ser Asn Phe Pro Phe His Ser Asn      Pro
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Asp Asn Leu Thr Ser Phe Leu Lys Gly Glu Leu Val Leu Leu Phe Gly
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Ile Leu Asp Glu Tyr Lys Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu
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Tyr Gly Arg Tyr His Pro Lys Val Ile Pro
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      Gly Ile Tyr Trp Thr Lys

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WARF0235.ST25.txt  
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Cys Asn Asn Ile Leu Met Trp Thr Leu Leu Ala Pro Gly Ser Val Leu	
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acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag ata gtg	3668
Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val	
200 205 210 215	
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Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser Val Leu	
220 225 230	
cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc caa atg	3764
Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met	
235 240 245	
gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa ata tgg	3812
Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys Ile Trp	
250 255 260	
att tgt gtc tgc gaa gat ttt gat gag aag agg tta ata aag gca att	3860
Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile	
265 270 275	
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Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala	
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Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr Leu	
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Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe Met	
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Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu Ala Ala	
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Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg Ala Trp	
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## WARF0235.ST25.txt

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ttt ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta aga gtg Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu Arg Val 570 575 580	4772
ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc att gga Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser Ile Gly 585 590 595	4820
gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc atg cgt Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly Met Arg 600 605 610 615	4868
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## WARF0235.ST25.txt

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## WARF0235.ST25.txt

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 1 5 10 15  
 ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa 96  
 Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
 20 25 30  
 agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct 144  
 Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45  
 cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa 192  
 Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60  
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 Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80  
 acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca 288  
 Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95  
 aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg 336  
 Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
 100 105 110  
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 Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
 115 120 125  
 cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct 432  
 His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser  
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## WARF0235.ST25.txt

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Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys																									
210	215	220																							
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Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp																									
260	265	270																							
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Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val																									
275	280	285																							
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Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu																									
290	295	300																							
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325	330	335																							
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Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp																									
405	410	415																							
gcc aaa atg aaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt	1296																								
Ala Lys Met Lys Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly																									
420	425	430																							
ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa	1344																								
Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu																									
435	440	445																							
gta tgg aaa gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt	1392																								
Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val																									
450	455	460																							



## WARF0235.ST25.txt

aaa gat ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu 465 470 475 480	1440
gca aca tct ctg ttt tca gca aac aca tca agc agc aat atc cgt gaa Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu 485 490 495	1488
ata aat aaa cac agt tac aca cat atg atg tcc att ggt ttc gcc gaa Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu 500 505 510	1536
gtg gtg ttt ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu 515 520 525	1584
aga gtg ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser 530 535 540	1632
att gga gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly 545 550 555 560	1680
atg cgt agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr 565 570 575	1728
ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr 580 585 590	1776
agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser 595 600 605	1824
ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr 610 615 620	1872
cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640	1920
cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655	1968
aga gtg aag aat gat atg gac gca aaa gaa gcc aat tta tct gca aaa Arg Val Lys Asn Asp Met Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670	2016
ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His 675 680 685	2064
ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690 695 700	2112
tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705 710 715 720	2160
cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725 730 735	2208
att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu	2256

## WARF0235.ST25.txt

740	745	750	
cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755 760 765			2304
tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770 775 780			2352
ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785 790 795 800			2400
ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805 810 815			2448
gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn 820 825 830			2496
ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr 835 840 845			2544
tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu 850 855 860			2592
aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala 865 870 875 880			2640
agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgt tgc gca cta Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu 885 890 895			2688
gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu 900 905 910			2736
tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu 915 920 925			2784
cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln 930 935 940			2832
ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile 945 950 955 960			2880
tct cac att cct aat gtg aat ata tat att taa Ser His Ile Pro Asn Val Asn Ile Tyr Ile 965 970			2913

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WARF0235.ST25.txt

Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
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Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
35 40 45

Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
50 55 60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
65 70 75 80

Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro  
85 90 95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
100 105 110

Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
115 120 125

His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser  
130 135 140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
145 150 155 160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser  
165 170 175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala  
180 185 190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys  
195 200 205

Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys  
210 215 220

Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp  
225 230 235 240

Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg  
245 250 255

Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp  
260 265 270

Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val  
275 280 285

Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu  
290 295 300

Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu  
 305 310 315 320  
 Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu  
 325 330 335  
 Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu  
 340 345 350  
 Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg  
 355 360 365  
 Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp  
 370 375 380  
 Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro  
 385 390 395 400  
 Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp  
 405 410 415  
 Ala Lys Met Lys Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly  
 420 425 430  
 Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu  
 435 440 445  
 Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val  
 450 455 460  
 Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu  
 465 470 475 480  
 Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu  
 485 490 495  
 Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu  
 500 505 510  
 Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu  
 515 520 525  
 Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser  
 530 535 540  
 Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly  
 545 550 555 560  
 Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr  
 565 570 575

## WARF0235.ST25.txt

Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr  
 580 585 590

Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser  
 595 600 605

Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr  
 610 615 620

Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu  
 625 630 635 640

Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu  
 645 650 655

Arg Val Lys Asn Asp Met Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys  
 660 665 670

Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His  
 675 680 685

Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His  
 690 695 700

Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu  
 705 710 715 720

Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu  
 725 730 735

Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu  
 740 745 750

Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu  
 755 760 765

Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg  
 770 775 780

Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser  
 785 790 795 800

Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu  
 805 810 815

Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn  
 820 825 830

Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr  
 835 840 845

Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu  
 850 855 860

Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala  
865 870 875 880

Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu  
885 890 895

Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu  
900 905 910

Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu  
915 920 925

Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln  
930 935 940

Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile  
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Ser His Ile Pro Asn Val Asn Ile Tyr Ile  
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ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa 96  
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
20 25 30  
agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct 144  
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
35 40 45  
cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa 192  
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
50 55 60  
ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa 240  
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
65 70 75 80  
acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca 288

## WARF0235.ST25.txt

Thr	Lys	Ala	Thr	Arg	Phe	Ser	Gln	Ser	Glu	Tyr	Gly	Arg	Tyr	His	Pro	
				85					90					95		
aag	ggt	atc	cct	ttc	cgt	cac	aag	gtc	ggg	aaa	agg	atg	gac	caa	gtg	336
Lys	Val	Ile	Pro	Phe	Arg	His	Lys	Val	Gly	Lys	Arg	Met	Asp	Gln	Val	
			100					105					110			
atg	aaa	aaa	cta	aag	gca	att	gct	gag	gaa	aga	aag	aat	ttt	cat	ttg	384
Met	Lys	Lys	Leu	Lys	Ala	Ile	Ala	Glu	Glu	Arg	Lys	Asn	Phe	His	Leu	
		115					120					125				
cac	gaa	aaa	att	gta	gag	aga	caa	gct	gtagacggg	aaacaggtac						431
His	Glu	Lys	Ile	Val	Glu	Arg	Gln	Ala								
		130					135									
tc	atc	ctt	aaa	ttag	tattac	aaca	actaag	ttt	atattca	tttttttggc	aattatgaaa					491
tt	cag	aaa	agg	gtt	aaatat	act	catgtcc	tat	cgtaa	aat	agtgt	aaata	tac	ctctcgt		551
tgt	act	tttcg	atct	gaatat	act	tgt	caaaa	tct	ggcaagc	tcaga	aatcaa	att	atccacc			611
cca	act	tttta	aata	ctcgat	atct	tttagaa	atcc	acct	gtc	taa	ctc	atc	cac	tac		667
									Val		Leu	Ile	His	Tyr		140
cca	ttc	cct	ttg	ctt	tga	att	ctt	ttc	ttt	acc	tat	aaa	cgt	gga	aca	715
Pro	Phe	Pro	Leu	Leu		Ile	Leu	Phe	Phe	Thr	Tyr	Lys	Arg	Gly	Thr	
			145					150					155			
ctc	gat	ccg	ttt	tgc	ttt	tct	taa	caa	agc	agc	tca	gag	aaa	aga	ggt	763
Leu	Asp	Pro	Phe	Cys	Phe	Ser		Gln	Ser	Ser	Ser	Glu	Lys	Arg	Gly	
		160						165					170			
ttt	ctt	cta	ttc	tgt	ttc	tct	gtg	tgc	tgc	act	tgg	gtc	ctt	aat	ccc	811
Phe	Leu	Leu	Phe	Cys	Phe	Ser	Val	Cys	Cys	Thr	Trp	Val	Leu	Asn	Pro	
		175					180					185				
att	aaa	aac	agg	gca	tgt	taa	tcc	caa	cga	cgg	tag	cct	ttc	ctg	aca	859
Ile	Lys	Asn	Arg	Ala	Cys		Ser	Gln	Arg	Arg		Pro	Phe	Leu	Thr	
		190					195						200			
gct	gac	tgt	aaa	ttt	tgt	cta	aca	aag	aaa	aaa	aaa	gat	tag	aca	tgt	907
Ala	Asp	Cys	Lys	Phe	Cys	Leu	Thr	Lys	Lys	Lys	Lys	Asp		Thr	Cys	
		205					210					215				
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Phe	Ser	Leu	Ser	Leu	Ile	Arg	Leu	Asp	Phe	Phe	Gln	Ser	Gly	Thr		
		220					225					230				
ggg	ata	tat	tgg	acc	aaa	agt	aga	atg	ggt	ata	tat	tta	aag	tat	ttc	1003
Gly	Ile	Tyr	Trp	Thr	Lys	Ser	Arg	Met	Gly	Ile	Tyr	Leu	Lys	Tyr	Phe	
		235					240					245				
tga	tag	aac	agg	agt	ata	ttg	tgc	gaa	aat	atc	ctc	tat	ttt	ctg	ttg	1051
		Asn	Arg	Ser	Ile	Leu	Cys	Glu	Asn	Ile	Leu	Tyr	Phe	Leu	Leu	
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tct	cct	aat	gag	ttt	gaa	tgt	aat	aat	att	ctc	atg	tgg	aca	ttg	ctt	1099
Ser	Pro	Asn	Glu	Phe	Glu	Cys	Asn	Asn	Ile	Leu	Met	Trp	Thr	Leu	Leu	
		265					270					275				
gca	cca	ggt	tct	gta	tta	acc	gaa	ccg	cag	gtt	tat	gga	aga	gac	aaa	1147
Ala	Pro	Gly	Ser	Val	Leu	Thr	Glu	Pro	Gln	Val	Tyr	Gly	Arg	Asp	Lys	
		280				285					290					
gag	aaa	gat	gag	ata	gtg	aaa	atc	cta	ata	aac	aat	gtt	agt	gat	gcc	1195
Glu	Lys	Asp	Glu	Ile	Val	Lys	Ile	Leu	Ile	Asn	Asn	Val	Ser	Asp	Ala	
		295			300					305					310	
caa	cac	ctt	tca	gtc	ctc	cca	ata	ctt	ggt	atg	ggg	gga	tta	gga	aaa	1243

## WARF0235.ST25.txt

Gln	His	Leu	Ser	Val	Leu	Pro	Ile	Leu	Gly	Met	Gly	Gly	Leu	Gly	Lys		
				315					320						325		
acg	act	ctt	gcc	caa	atg	gtc	ttc	aat	gac	cag	aga	gtt	act	gag	cat	1291	
Thr	Thr	Leu	Ala	Gln	Met	Val	Phe	Asn	Asp	Gln	Arg	Val	Thr	Glu	His		
			330					335					340				
ttc	cat	tcc	aaa	ata	tgg	att	tgt	gtc	tcg	gaa	gat	ttt	gat	gag	aag	1339	
Phe	His		Lys	Ile	Trp	Ile	Cys	Val	Ser	Glu	Asp	Phe	Asp	Glu	Lys		
			345				350					355					
agg	tta	ata	aag	gca	att	gta	gaa	tct	att	gaa	gga	agg	cca	cta	ctt	1387	
Arg	Leu	Ile	Lys	Ala	Ile	Val	Glu	Ser	Ile	Glu	Gly	Arg	Pro	Leu	Leu		
	360					365						370					
ggg	gag	atg	gac	ttg	gct	cca	ctt	caa	aag	aag	ctt	cag	gag	ttg	ctg	1435	
Gly	Glu	Met	Asp	Leu		Pro	Leu	Gln	Lys	Lys	Leu	Gln	Glu	Leu			
	375			380						385				390			
aat	gga	aaa	aga	tac	ttg	ctt	gtc	tta	gat	gat	gtt	tgg	aat	gaa	gat	1483	
Asn	Gly	Lys	Arg	Tyr	Leu	Leu	Val	Leu	Asp	Asp	Val	Trp	Asn	Glu	Asp		
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caa	cag	aag	tgg	gct	aat	tta	aga	gca	gtc	ttg	aag	gtt	gga	gca	agt	1531	
Gln	Gln	Lys	Trp	Ala	Asn	Leu	Arg	Ala	Val	Leu	Lys	Val	Gly	Ala	Ser		
			410					415					420				
ggg	gct	tct	gtt	cta	acc	act	act	cgt	ctt	gaa	aag	gtt	gga	tca	att	1579	
Gly	Ala	Ser	Val	Leu	Thr	Thr	Arg	Leu	Glu	Lys	Val	Gly	Ser	Ile			
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atg	gga	aca	ttg	caa	cca	tat	gaa	ctg	tca	aat	ctg	tct	caa	gaa	gat	1627	
Met	Gly	Thr	Leu	Gln	Pro	Tyr	Glu	Leu	Ser	Asn	Leu	Ser	Gln	Glu	Asp		
			440			445						450					
tgt	tgg	ttg	ttg	ttc	atg	caa	cgt	gca	ttt	gga	cac	caa	gaa	gaa	ata	1675	
Cys	Trp	Leu	Leu	Phe	Met	Gln	Arg	Ala	Phe	Gly	His	Gln	Glu	Glu	Ile		
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aat	cca	aac	ctt	gtg	gca	atc	gga	aag	gag	att	gtg	aaa	aaa	agt	ggg	1723	
Asn	Pro	Asn	Leu	Val	Ala	Ile	Gly	Lys	Glu	Ile	Val	Lys	Lys	Ser	Gly		
				475					480					485			
ggg	gtg	cct	cta	gca	gcc	aaa	act	ctt	gga	ggg	att	ttg	tgc	ttc	aag	1771	
Gly	Val	Pro	Leu	Ala	Ala	Lys	Thr	Leu	Gly	Gly	Ile	Leu	Cys	Phe	Lys		
			490					495					500				
aga	gaa	gaa	aga	gca	tgg	gaa	cat	gtg	aga	gac	agt	ccg	att	tgg	aat	1819	
Arg	Glu		Arg	Ala	Trp	Glu	His	Val	Arg	Asp	Ser	Pro	Ile	Trp	Asn		
			505				510					515					
ttg	cct	caa	gat	gaa	agt	tct	att	ctg	cct	gcc	ctg	agg	ctt	agt	tac	1867	
Leu	Pro	Gln	Asp	Glu	Ser	Ser	Ile	Leu	Pro	Ala	Leu	Arg	Leu	Ser	Tyr		
			520				525					530					
cat	caa	ctt	cca	ctt	gat	ttg	aaa	caa	tgc	ttt	gcg	tat	tgt	gcg	gtg	1915	
His	Gln	Leu	Pro	Leu	Asp	Leu	Lys	Gln	Cys	Phe	Ala	Tyr	Cys	Ala	Val		
					540					545					550		
ttc	cca	aag	gat	gcc	aaa	atg	gaa	aaa	gaa	aag	cta	atc	tct	ctc	tgg	1963	
Phe	Pro	Lys	Asp	Ala	Lys	Met	Glu	Lys	Glu	Lys	Leu	Ile	Ser	Leu	Trp		
				555					560					565			
atg	gcg	cat	ggg	ttt	ctt	tta	tca	aaa	gga	aac	atg	gag	cta	gag	gat	2011	
Met	Ala	His	Gly	Phe	Leu	Leu	Ser	Lys	Gly	Asn	Met	Glu	Leu	Glu	Asp		
				570				575					580				
gtg	ggc	gat	gaa	gta	tgg	aaa	gaa	tta	tac	ttg	agg	tct	ttt	ttc	caa	2059	
Val	Gly	Asp	Glu	Val	Trp	Lys	Glu	Leu	Tyr	Leu	Arg	Ser	Phe	Phe	Gln		
			585				590					595					



## WARF0235.ST25.txt

gag att gaa gtt aaa gat ggt aaa act tat ttc aag atg cat gat ctc Glu Ile Glu Val Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu 600 605 610	2107
atc cat gat ttg gca aca tct ctg ttt tca gca aac aca tca agc agc Ile His Asp Leu Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser 615 620 625 630	2155
aat atc cgt gaa ata aat aaa cac agt tac aca cat atg atg tcc att Asn Ile Arg Glu Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile 635 640 645	2203
ggt ttc gcc gaa gtg gtg ttt ttt tac act ctt ccc ccc ttg gaa aag Gly Phe Ala Glu Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys 650 655 660	2251
ttt atc tcg tta aga gtg ctt aat cta ggt gat tcg aca ttt aat aag Phe Ile Ser Leu Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys 665 670 675	2299
tta cca tct tcc att gga gat cta gta cat tta aga tac ttg aac ctg Leu Pro Ser Ser Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu 680 685 690	2347
tat ggc agt ggc atg cgt agt ctt cca aag cag tta tgc aag ctt caa Tyr Gly Ser Gly Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln 695 700 705 710	2395
aat ctg caa act ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg Asn Leu Gln Thr Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu 715 720 725	2443
cca aaa gaa aca agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat Pro Lys Glu Thr Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp 730 735 740	2491
ggt agc cag tca ttg act tgt atg cca cca agg ata gga tca ttg aca Gly Ser Gln Ser Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr 745 750 755	2539
tgc ctt aag act cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat Cys Leu Lys Thr Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr 760 765 770	2587
caa ctt ggt gaa cta gga aac cta aat ctc tat ggc tca att aaa atc Gln Leu Gly Glu Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile 775 780 785 790	2635
tcg cat ctt gag aga gtg aag aat gat aag gac gca aaa gaa gcc aat Ser His Leu Glu Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn 795 800 805	2683
tta tct gca aaa ggg aat ctg cat tct tta agc atg agt tgg aat aac Leu Ser Ala Lys Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn 810 815 820	2731
ttt gga cca cat ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc Phe Gly Pro His Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala 825 830 835	2779
ctc aaa cca cac tcc aat ctg act tct tta aaa atc tat ggc ttc aga Leu Lys Pro His Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg 840 845 850	2827
gga atc cat ctc cca gag tgg atg aat cac tca gta ttg aaa aat att Gly Ile His Leu Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile 855 860 865 870	2875
gtc tct att cta att agc aac ttc aga aac tgc tca tgc tta cca ccc	2923

WARF0235.ST25.txt

Val	Ser	Ile	Leu	Ile	Ser	Asn	Phe	Arg	Asn	Cys	Ser	Cys	Leu	Pro	Pro		
				875					880					885			
ttt	ggt	gat	ctg	cct	tgt	cta	gaa	agt	cta	gag	tta	cac	tgg	ggg	tct	2971	
Phe	Gly	Asp	Leu	Pro	Cys	Leu	Glu	Ser	Leu	Glu	Leu	His	Trp	Gly	Ser		
			890					895					900				
gcg	gat	gtg	gag	tat	gtt	gaa	gaa	gtg	gat	att	gat	gtt	cat	tct	gga	3019	
Ala	Asp	Val	Glu	Tyr	Val	Glu	Glu	Val	Asp	Ile	Asp	Val	His	Ser	Gly		
			905					910					915				
ttc	ccc	aca	aga	ata	agg	ttt	cca	tcc	ttg	agg	aaa	ctt	gat	ata	tgg	3067	
Phe	Pro	Thr	Arg	Ile	Arg	Phe	Pro	Ser	Leu	Arg	Lys	Leu	Asp	Ile	Trp		
			920					925					930				
gac	ttt	ggt	agt	ctg	aaa	gga	ttg	ctg	aaa	aag	gaa	gga	gaa	gag	caa	3115	
Asp	Phe	Gly	Ser	Leu	Lys	Gly	Leu	Leu	Lys	Lys	Glu	Gly	Glu	Glu	Gln		
					940					945					950		
ttc	cct	gtg	ctt	gaa	gag	atg	ata	att	cac	gag	tgc	cct	ttt	ctg	acc	3163	
Phe	Pro	Val	Leu	Glu	Met	Ile	Ile		His	Glu	Cys	Pro	Phe	Leu	Thr		
				955					960					965			
ctt	tct	tct	aat	ctt	agg	gct	ctt	act	tcc	ctc	aga	att	tgc	tat	aat	3211	
Leu	Ser	Ser	Asn	Leu	Arg	Ala	Leu	Thr	Ser	Leu	Arg	Ile	Cys	Tyr	Asn		
			970					975						980			
aaa	gta	gct	act	tca	ttc	cca	gaa	gag	atg	ttc	aaa	aac	ctt	gca	aat	3259	
Lys	Val	Ala	Thr	Ser	Phe	Pro	Glu	Glu	Met	Phe	Lys	Asn	Leu	Ala	Asn		
			985					990					995				
ctc	aaa	tac	ttg	aca	atc	tct	cgg	tgc	aat	aat	ctc	aaa	gag	ctg		3304	
Leu	Lys	Tyr	Leu	Thr	Ile	Ser	Arg	Cys	Asn	Asn	Leu	Lys	Glu	Leu			
			1000					1005					1010				
cct	acc	agc	ttg	gct	agt	ctg	aat	gct	ttg	aaa	agt	cta	aaa	att		3349	
Pro	Thr	Ser	Leu	Ala	Ser	Leu	Asn	Ala	Leu	Lys	Ser	Leu	Lys	Ile			
			1015					1020					1025				
caa	ttg	tgt	tgc	gca	cta	gag	agt	ctc	cct	gag	gaa	ggg	ctg	gaa		3394	
Gln	Leu	Cys	Cys	Ala	Leu	Glu	Ser	Leu	Pro	Glu	Glu	Gly	Leu	Glu			
								1035					1040				
ggt	tta	tct	tca	ctc	aca	gag	tta	ttt	gtt	gaa	cac	tgt	aac	atg		3439	
Gly	Leu	Ser	Ser	Leu	Thr	Glu	Leu	Phe	Val	Glu	His	Cys	Asn	Met			
								1050					1055				
cta	aaa	tgt	tta	cca	gag	gga	ttg	cag	cac	cta	aca	acc	ctc	aca		3484	
Leu	Lys	Cys	Leu	Pro	Glu	Gly	Leu	Gln	His	Leu	Thr	Thr	Leu	Thr			
								1065					1070				
agt	tta	aaa	att	cgg	gga	tgt	cca	caa	ctg	atc	aag	cgg	tgt	gag		3529	
Ser	Leu	Lys	Ile	Arg	Gly	Cys	Pro	Gln	Leu	Ile	Lys	Arg	Cys	Glu			
								1080					1085				
aag	gga	ata	gga	gaa	gac	tgg	cac	aaa	att	tct	cac	att	cct	aat		3574	
Lys	Gly	Ile	Gly	Glu	Asp	Trp	His	Lys	Ile	Ser	His	Ile	Pro	Asn			
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gtg	aat	ata	tat	att	taa											3592	
Val	Asn	Ile	Tyr	Ile													
																1105	

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 <211> 2913  
 <212> DNA  
 <213> Solanum bulbocastanum

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(2913)

&lt;400&gt; 7

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1 5 10 15	
ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa	96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln	
20 25 30	
agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct	144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala	
35 40 45	
cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa	192
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys	
50 55 60	
ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa	240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys	
65 70 75 80	
acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca	288
Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro	
85 90 95	
aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg	336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val	
100 105 110	
atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg	384
Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu	
115 120 125	
cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct	432
His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser	
130 135 140	
gta tta acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag	480
Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu	
145 150 155 160	
ata gtg aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca	528
Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser	
165 170 175	
gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc	576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala	
180 185 190	
caa atg gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa	624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys	
195 200 205	
ata tgg att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag	672
Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys	
210 215 220	
gca att gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac	720
Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp	
225 230 235 240	
ttg gct cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga	768
Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg	
245 250 255	
tac ttg ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg	816

WARF0235.ST25.txt

Tyr	Leu	Leu	Val	Leu	Asp	Asp	Val	Trp	Asn	Glu	Asp	Gln	Gln	Lys	Trp	
			260					265						270		
gct	aat	tta	aga	gca	gtc	ttg	aag	ggt	gga	gca	agt	ggt	gct	tct	gtt	864
Ala	Asn	Leu	Arg	Ala	Val	Leu	Lys	Val	Gly	Ala	Ser	Gly	Ala	Ser	Val	
		275					280					285				
cta	acc	act	act	cgt	ctt	gaa	aag	ggt	gga	tca	att	atg	gga	aca	ttg	912
Leu	Thr	Thr	Thr	Arg	Leu	Glu	Lys	Val	Gly	Ser	Ile	Met	Gly	Thr	Leu	
	290					295					300					
caa	cca	tat	gaa	ctg	tca	aat	ctg	tct	caa	gaa	gat	tgt	tgg	ttg	ttg	960
Gln	Pro	Tyr	Glu	Leu	Ser	Asn	Leu	Ser	Gln	Glu	Asp	Cys	Trp	Leu	Leu	
305					310					315					320	
ttc	atg	caa	cgt	gca	ttt	gga	cac	caa	gaa	gaa	ata	aat	cca	aac	ctt	1008
Phe	Met	Gln	Arg	Ala	Phe	Gly	His	Gln	Glu	Ile	Asn	Pro	Asn	Leu		
				325					330					335		
gtg	gca	atc	gga	aag	gag	att	gtg	aaa	aaa	agt	ggt	ggt	gtg	cct	cta	1056
Val	Ala	Ile	Gly	Lys	Glu	Ile	Val	Lys	Lys	Ser	Gly	Gly	Val	Pro	Leu	
			340					345					350			
gca	gcc	aaa	act	ctt	gga	ggt	att	ttg	tgc	ttc	aag	aga	gaa	gaa	aga	1104
Ala	Ala	Lys	Thr	Leu	Gly	Gly	Ile	Leu	Cys	Phe	Lys	Arg	Glu	Glu	Arg	
		355					360					365				
gca	tgg	gaa	cat	gtg	aga	gac	agt	ccg	att	tgg	aat	ttg	cct	caa	gat	1152
Ala	Trp	Glu	His	Val	Arg	Asp	Ser	Pro	Ile	Trp	Asn	Leu	Pro	Gln	Asp	
	370					375					380					
gaa	agt	tct	att	ctg	cct	gcc	ctg	agg	ctt	agt	tac	cat	caa	ctt	cca	1200
Glu	Ser	Ser	Ile	Leu	Pro	Ala	Leu	Arg	Leu	Ser	Tyr	His	Gln	Leu	Pro	
385					390					395					400	
ctt	gat	ttg	aaa	caa	tgc	ttt	gcg	tat	tgt	gcg	gtg	ttc	cca	aag	gat	1248
Leu	Asp	Leu	Lys	Gln	Cys	Phe	Ala	Tyr	Cys	Ala	Val	Phe	Pro	Lys	Asp	
				405					410					415		
gcc	aaa	atg	gaa	aaa	gaa	aag	cta	atc	tct	ctc	tgg	atg	gcg	cat	ggt	1296
Ala	Lys	Met	Glu	Lys	Glu	Lys	Leu	Ile	Ser	Leu	Trp	Met	Ala	His	Gly	
			420					425					430			
ttt	ctt	tta	tca	aaa	gga	aac	atg	gag	cta	gag	gat	gtg	ggc	gat	gaa	1344
Phe	Leu	Leu	Ser	Lys	Gly	Asn	Met	Glu	Leu	Glu	Asp	Val	Gly	Asp	Glu	
		435					440					445				
gta	tgg	aaa	gaa	tta	tac	ttg	agg	tct	ttt	ttc	caa	gag	att	gaa	gtt	1392
Val	Trp	Lys	Glu	Leu	Tyr	Leu	Arg	Ser	Phe	Phe	Gln	Glu	Ile	Glu	Val	
	450					455					460					
aaa	gat	ggt	aaa	act	tat	ttc	aag	atg	cat	gat	ctc	atc	cat	gat	ttg	1440
Lys	Asp	Gly	Lys	Thr	Tyr	Phe	Lys	Met	His	Asp	Leu	Ile	His	Asp	Leu	
465					470					475					480	
gca	aca	tct	ctg	ttt	tca	gca	aac	aca	tca	agc	agc	aat	atc	cgt	gaa	1488
Ala	Thr	Ser	Leu	Phe	Ser	Ala	Asn	Thr	Ser	Ser	Ser	Asn	Ile	Arg	Glu	
				485					490					495		
ata	aat	aaa	cac	agt	tac	aca	cat	atg	atg	tcc	att	ggt	ttc	gcc	gaa	1536
Ile	Asn	Lys	His	Ser	Tyr	Thr	His	Met	Met	Ser	Ile	Gly	Phe	Ala	Glu	
			500					505					510			
gtg	gtg	ttt	ttt	tac	act	ctt	ccc	ccc	ttg	gaa	aag	ttt	atc	tcg	tta	1584
Val	Val	Phe	Phe	Tyr	Thr	Leu	Pro	Pro	Leu	Glu	Lys	Phe	Ile	Ser	Leu	
		515					520					525				
aga	gtg	ctt	aat	cta	ggt	gat	tcg	aca	ttt	aat	aag	tta	cca	tct	tcc	1632
Arg	Val	Leu	Asn	Leu	Gly	Asp	Ser	Thr	Phe	Asn	Lys	Leu	Pro	Ser	Ser	
	530					535					540					

## WARF0235.ST25.txt

att gga gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly 545 550 555 560	1680
atg cgt agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr 565 570 575	1728
ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr 580 585 590	1776
agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser 595 600 605	1824
ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr 610 615 620	1872
cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640	1920
cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655	1968
aga gtg aag aat gat aag gac gca aaa gaa gcc aat tta tct gca aaa Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670	2016
ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His 675 680 685	2064
ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690 695 700	2112
tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705 710 715 720	2160
cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725 730 735	2208
att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu 740 745 750	2256
cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755 760 765	2304
tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770 775 780	2352
ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785 790 795 800	2400
ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805 810 815	2448
gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat	2496

## WARF0235.ST25.txt

Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn  
 820 825 830  
 ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act 2544  
 Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr  
 835 840 845  
 tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg 2592  
 Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu  
 850 855 860  
 aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct 2640  
 Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala  
 865 870 875 880  
 agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgt tgc gca cta 2688  
 Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu  
 885 890 895  
 gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag 2736  
 Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu  
 900 905 910  
 tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg 2784  
 Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu  
 915 920 925  
 cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa 2832  
 Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln  
 930 935 940  
 ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att 2880  
 Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile  
 945 950 955 960  
 tct cac att cct aat gtg aat ata tat att taa 2913  
 Ser His Ile Pro Asn Val Asn Ile Tyr Ile  
 965 970

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<400> 8

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 20 25 30  
 Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45  
 Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60  
 Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80  
 Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95

WARF0235.ST25.txt

- Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
100 105 110

Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
115 120 125

His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser  
130 135 140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
145 150 155 160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser  
165 170 175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala  
180 185 190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys  
195 200 205

Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys  
210 215 220

Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp  
225 230 235 240

Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg  
245 250 255

Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp  
260 265 270

Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val  
275 280 285

Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu  
290 295 300

Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu  
305 310 315 320

Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu  
325 330 335

Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu  
340 345 350

Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg  
355 360 365

Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp

370

375

380

Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro  
 385 390 395 400

Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp  
 405 410 415

Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly  
 420 425 430

Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu  
 435 440 445

Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val  
 450 455 460

Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu  
 465 470 475 480

Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu  
 485 490 495

Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu  
 500 505 510

Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu  
 515 520 525

Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser  
 530 535 540

Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly  
 545 550 555 560

Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr  
 565 570 575

Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr  
 580 585 590

Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser  
 595 600 605

Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr  
 610 615 620

Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu  
 625 630 635 640

Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu  
 645 650 655



Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys  
 660 665 670  
 Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His  
 675 680 685  
 Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His  
 690 695 700  
 Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu  
 705 710 715 720  
 Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu  
 725 730 735  
 Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu  
 740 745 750  
 Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu  
 755 760 765  
 Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg  
 770 775 780  
 Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser  
 785 790 795 800  
 Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu  
 805 810 815  
 Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn  
 820 825 830  
 Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr  
 835 840 845  
 Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu  
 850 855 860  
 Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala  
 865 870 875 880  
 Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu  
 885 890 895  
 Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu  
 900 905 910  
 Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu  
 915 920 925  
 Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln

930

935

940

Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile  
 945 950 955 960

Ser His Ile Pro Asn Val Asn Ile Tyr Ile  
 965 970

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 1 5 10 15  
 atc caa ggg gaa ctt gga ttg gtt ttt ggt ttc gag aag gag ttt aaa 96  
 Ile Gln Gly Glu Leu Gly Leu Val Phe Gly Phe Glu Lys Glu Phe Lys  
 20 25 30  
 aaa ctt tca agt atg ttt tca atg atc caa gct gtg cta gaa gat gct 144  
 Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45  
 caa gag aag caa ctg aag tac aag gca ata aag aac tgg tta cag aaa 192  
 Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys Asn Trp Leu Gln Lys  
 50 55 60  
 ctc aat gtt gct gca tat gaa gtt gat gac atc ttg gat gac tgt aaa 240  
 Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile Leu Asp Asp Cys Lys  
 65 70 75 80  
 act gag gca gca aga ttc aag cag gct gta ttg ggg cgt tat cat cca 288  
 Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu Gly Arg Tyr His Pro  
 85 90 95  
 cgg acc atc act ttc tgt tac aag gtg gga aaa aga atg aaa gaa atg 336  
 Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys Arg Met Lys Glu Met  
 100 105 110  
 atg gaa aaa cta gat gca att gca gag gaa cgg agg aat ttt cat tta 384  
 Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Asn Phe His Leu  
 115 120 125  
 gat gaa agg att ata gag aga caa gct gct aga cgg caa aca ggt ttt 432  
 Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg Arg Gln Thr Gly Phe  
 130 135 140  
 gtt tta act gag cca aaa gtt tat gga agg gaa aaa gag gag gat gag 480  
 Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Glu Lys Glu Glu Asp Glu  
 145 150 155 160  
 ata gtg aaa atc ttg ata aac aat gtt agt tat tcc gaa gaa gtt cca 528  
 Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr Ser Glu Glu Val Pro  
 165 170 175  
 gta ctc cca ata ctt ggt atg ggg gga cta gga aag acg act cta gcc 576  
 Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala  
 180 185 190

WARF0235.ST25.txt

caa atg gtc ttc aat gat caa aga att act gag cat ttc aat cta aag Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu His Phe Asn Leu Lys 195 200 205	624
ata tgg gtt tgt gtc tca gat gat ttt gat gag aag agg ttg att aag Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu Ile Lys 210 215 220	672
gca att gta gaa tct att gaa gga aag tca ctg ggt gac atg gac ttg Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Gly Asp Met Asp Leu 225 230 235 240	720
gct ccc ctc cag aaa aag ctt cag gag ttg ttg aat gga aaa aga tac Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr 245 250 255	768
ttt ctt gtt ttg gat gat gtt tgg aat gaa gat caa gaa aag tgg gat Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Glu Lys Trp Asp 260 265 270	816
aat ctt aga gca gta ttg aag att gga gct agt ggt gct tca att cta Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser Gly Ala Ser Ile Leu 275 280 285	864
att act act cgt ctt gaa aaa att gga tca att atg gga act ttg caa Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile Met Gly Thr Leu Gln 290 295 300	912
cta tat cag tta tca aat ttg tct caa gaa gat tgt tgg ttg ttg ttc Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe 305 310 315 320	960
aag caa cgt gca ttt tgc cac caa acc gaa aca agt cct aaa ctt atg Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr Ser Pro Lys Leu Met 325 330 335	1008
gaa atc gga aag gag att gtg aag aaa tgt ggg ggt gtg cct cta gca Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala 340 345 350	1056
gcc aaa act ctt gga ggc ctt tta cgc ttc aag agg gaa gaa agt gaa Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu Ser Glu 355 360 365	1104
tgg gaa cat gtg aga gat agt gag att tgg aat tta cct caa gat gaa Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn Leu Pro Gln Asp Glu 370 375 380	1152
aat tct gtt ttg cct gcc ctg agg ctg agt tat cat cat ctt cca ctt Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu 385 390 395 400	1200
gat ttg aga caa tgt ttt gca tat tgc gca gta ttc cca aag gac acc Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp Thr 405 410 415	1248
aaa ata gaa aag gaa tat ctc atc gct ctc tgg atg gca cac agt ttt Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp Met Ala His Ser Phe 420 425 430	1296
ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc aat gaa gta Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asn Glu Val 435 440 445	1344
tgg aat gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt aaa Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Lys 450 455 460	1392
tct ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg gct Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala	1440

## WARF0235.ST25.txt

465	470	475	480	
aca tct atg ttt tca gca agc gca tca agc aga agt ata cgc caa ata				1488
Thr Ser Met Phe Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln Ile	485	490	495	
aat gta aaa gat gat gaa gat atg atg ttc att gta aca aat tat aaa				1536
Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr Lys	500	505	510	
gat atg atg tcc att ggt ttc tcc gaa gtg gtg tct tct tac tct cct				1584
Asp Met Met Ser Ile Gly Phe Ser Glu Val Val Ser Ser Tyr Ser Pro	515	520	525	
tcg ctc ttt aaa agg ttt gtc tcg tta agg gtg ctt aat cta agt aac				1632
Ser Leu Phe Lys Arg Phe Val Ser Leu Arg Val Leu Asn Leu Ser Asn	530	535	540	
tca gaa ttt gaa cag tta ccg tct tcc gtt gga gat cta gta cat tta				1680
Ser Glu Phe Glu Gln Leu Pro Ser Ser Val Gly Asp Leu Val His Leu	545	550	555	560
aga tac ctt gac ctg tct ggt aat aaa att tgt agt ctt cca aag agg				1728
Arg Tyr Leu Asp Leu Ser Gly Asn Lys Ile Cys Ser Leu Pro Lys Arg	565	570	575	
ttg tgc aag ctt caa aat ctg cag act ctt gat cta tat aat tgc cag				1776
Leu Cys Lys Leu Gln Asn Leu Gln Thr Leu Asp Leu Tyr Asn Cys Gln	580	585	590	
tca ctt tct tgt ttg ccg aaa caa aca agt aag ctt tgt agt ctc cgg				1824
Ser Leu Ser Cys Leu Pro Lys Gln Thr Ser Lys Leu Cys Ser Leu Arg	595	600	605	
aat ctt gta ctt gat cac tgt cca ttg act tct atg cca cca aga ata				1872
Asn Leu Val Leu Asp His Cys Pro Leu Thr Ser Met Pro Pro Arg Ile	610	615	620	
gga ttg ttg aca tgc ctt aag aca cta ggt tac ttt gtt gta ggc gag				1920
Gly Leu Leu Thr Cys Leu Lys Thr Leu Gly Tyr Phe Val Val Gly Glu	625	630	635	640
agg aaa ggt tat caa ctt ggt gaa cta cga aat tta aac ctc cgt ggt				1968
Arg Lys Gly Tyr Gln Leu Gly Glu Leu Arg Asn Leu Asn Leu Arg Gly	645	650	655	
gca att tca atc aca cat ctt gag aga gtg aaa aat gat atg gag gca				2016
Ala Ile Ser Ile Thr His Leu Glu Arg Val Lys Asn Asp Met Glu Ala	660	665	670	
aaa gaa gcc aat tta tct gca aaa gca aat cta cac tct tta agc atg				2064
Lys Glu Ala Asn Leu Ser Ala Lys Ala Asn Leu His Ser Leu Ser Met	675	680	685	
agt tgg gat aga cca aac aga tat gaa tcc gaa gaa gtt aaa gtg ctt				2112
Ser Trp Asp Arg Pro Asn Arg Tyr Glu Ser Glu Glu Val Lys Val Leu	690	695	700	
gaa gcc ctc aaa cca cat ccc aat ctg aaa tat tta gaa atc att gac				2160
Glu Ala Leu Lys Pro His Pro Asn Leu Lys Tyr Leu Glu Ile Ile Asp	705	710	715	720
ttc tgt gga ttc tgt ctc cct gac tgg atg aat cac tca gtt ttg aaa				2208
Phe Cys Gly Phe Cys Leu Pro Asp Trp Met Asn His Ser Val Leu Lys	725	730	735	
aat gtt gtc tct att cta att agc ggt tgt gaa aac tgc tcg tgc tta				2256
Asn Val Val Ser Ile Leu Ile Ser Gly Cys Glu Asn Cys Ser Cys Leu	740	745	750	

WARF0235.ST25.txt

cca ccc ttt ggt gag ctg cct tgt cta gaa agt ctg gag tta caa gac	2304
Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu Ser Leu Glu Leu Gln Asp	
755 760 765	
ggg tct gtg gag gtg gag tat gtt gaa gat tct gga ttc ctg aca aga	2352
Gly Ser Val Glu Val Glu Tyr Val Glu Asp Ser Gly Phe Leu Thr Arg	
770 775 780	
aga aga ttt cca tcc ctg aga aaa ctt cat ata ggt ggc ttt tgt aat	2400
Arg Arg Phe Pro Ser Leu Arg Lys Leu His Ile Gly Gly Phe Cys Asn	
785 790 795 800	
ctg aaa gga ttg cag aga atg aaa gga gca gag caa ttc ccc gtg ctt	2448
Leu Lys Gly Leu Gln Arg Met Lys Gly Ala Glu Gln Phe Pro Val Leu	
805 810 815	
gaa gag atg aag att tcg gat tgc cct atg ttt gtt ttt ccg acc ctt	2496
Glu Glu Met Lys Ile Ser Asp Cys Pro Met Phe Val Phe Pro Thr Leu	
820 825 830	
tct tct gtc aag aaa tta gaa att tgg ggg gag gca gat gca gga ggt	2544
Ser Ser Val Lys Lys Leu Glu Ile Trp Gly Glu Ala Asp Ala Gly Gly	
835 840 845	
ttg agc tcc ata tct aat ctc agc act ctt aca tcc ctc aag att ttc	2592
Leu Ser Ser Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Lys Ile Phe	
850 855 860	
agt aac cac aca gtg act tca cta ctg gaa gag atg ttc aaa aac ctt	2640
Ser Asn His Thr Val Thr Ser Leu Leu Glu Glu Met Phe Lys Asn Leu	
865 870 875 880	
gaa aat ctc ata tac ttg agt gtc tct ttc ttg gag aat ctc aaa gag	2688
Glu Asn Leu Ile Tyr Leu Ser Val Ser Phe Leu Glu Asn Leu Lys Glu	
885 890 895	
ctg cct acc agc ctg gct agt ctc aac aat ttg aag tgt ctg gat att	2736
Leu Pro Thr Ser Leu Ala Ser Leu Asn Asn Leu Lys Cys Leu Asp Ile	
900 905 910	
cgt tat tgt tac gca cta gag agt ctc ccc gag gaa ggg ctg gaa ggt	2784
Arg Tyr Cys Tyr Ala Leu Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly	
915 920 925	
tta tct tca ctc aca gag tta ttt gtt gaa cac tgt aac atg cta aaa	2832
Leu Ser Ser Leu Thr Glu Leu Phe Val Glu His Cys Asn Met Leu Lys	
930 935 940	
tgt tta cca gag gga ttg cag cac cta aca acc ctc aca agt tta aaa	2880
Cys Leu Pro Glu Gly Leu Gln His Leu Thr Thr Leu Thr Ser Leu Lys	
945 950 955 960	
att cgg gga tgt cca caa ctg atc aag cgg tgt gag aag gga ata gga	2928
Ile Arg Gly Cys Pro Gln Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly	
965 970 975	
gaa gac tgg cac aaa att tct cac att cct aat gtg aat ata tat att	2976
Glu Asp Trp His Lys Ile Ser His Ile Pro Asn Val Asn Ile Tyr Ile	
980 985 990	
taa	2979
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WARF0235.ST25.txt

Met Ala Glu Ala Phe Leu Gln Val Leu Leu Asp Asn Leu Thr Phe Phe  
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Ile Gln Gly Glu Leu Gly Leu Val Phe Gly Phe Glu Lys Glu Phe Lys  
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Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala Val Leu Glu Asp Ala  
35 40 45

Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys Asn Trp Leu Gln Lys  
50 55 60

Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile Leu Asp Asp Cys Lys  
65 70 75 80

Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu Gly Arg Tyr His Pro  
85 90 95

Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys Arg Met Lys Glu Met  
100 105 110

Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Asn Phe His Leu  
115 120 125

Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg Arg Gln Thr Gly Phe  
130 135 140

Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Glu Lys Glu Glu Asp Glu  
145 150 155 160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr Ser Glu Glu Val Pro  
165 170 175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala  
180 185 190

Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu His Phe Asn Leu Lys  
195 200 205

Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu Ile Lys  
210 215 220

Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Gly Asp Met Asp Leu  
225 230 235 240

Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr  
245 250 255

Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Glu Lys Trp Asp  
260 265 270

Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser Gly Ala Ser Ile Leu  
275 280 285

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Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile Met Gly Thr Leu Gln
290                295                300

Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe
305                310                315                320

Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr Ser Pro Lys Leu Met
                325                330                335

Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
                340                345                350

Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu Ser Glu
                355                360                365

Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn Leu Pro Gln Asp Glu
                370                375                380

Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385                390                395                400

Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp Thr
                405                410                415

Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp Met Ala His Ser Phe
                420                425                430

Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asn Glu Val
                435                440                445

Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Lys
                450                455                460

Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala
465                470                475                480

Thr Ser Met Phe Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln Ile
                485                490                495

Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr Lys
                500                505                510

Asp Met Met Ser Ile Gly Phe Ser Glu Val Val Ser Ser Tyr Ser Pro
                515                520                525

Ser Leu Phe Lys Arg Phe Val Ser Leu Arg Val Leu Asn Leu Ser Asn
                530                535                540

Ser Glu Phe Glu Gln Leu Pro Ser Ser Val Gly Asp Leu Val His Leu
545                550                555                560

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## WARF0235.ST25.txt

Arg Tyr Leu Asp Leu Ser Gly Asn Lys Ile Cys Ser Leu Pro Lys Arg  
 565 570 575

Leu Cys Lys Leu Gln Asn Leu Gln Thr Leu Asp Leu Tyr Asn Cys Gln  
 580 585 590

Ser Leu Ser Cys Leu Pro Lys Gln Thr Ser Lys Leu Cys Ser Leu Arg  
 595 600 605

Asn Leu Val Leu Asp His Cys Pro Leu Thr Ser Met Pro Pro Arg Ile  
 610 615 620

Gly Leu Leu Thr Cys Leu Lys Thr Leu Gly Tyr Phe Val Val Gly Glu  
 625 630 635 640

Arg Lys Gly Tyr Gln Leu Gly Glu Leu Arg Asn Leu Asn Leu Arg Gly  
 645 650 655

Ala Ile Ser Ile Thr His Leu Glu Arg Val Lys Asn Asp Met Glu Ala  
 660 665 670

Lys Glu Ala Asn Leu Ser Ala Lys Ala Asn Leu His Ser Leu Ser Met  
 675 680 685

Ser Trp Asp Arg Pro Asn Arg Tyr Glu Ser Glu Glu Val Lys Val Leu  
 690 695 700

Glu Ala Leu Lys Pro His Pro Asn Leu Lys Tyr Leu Glu Ile Ile Asp  
 705 710 715 720

Phe Cys Gly Phe Cys Leu Pro Asp Trp Met Asn His Ser Val Leu Lys  
 725 730 735

Asn Val Val Ser Ile Leu Ile Ser Gly Cys Glu Asn Cys Ser Cys Leu  
 740 745 750

Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu Ser Leu Glu Leu Gln Asp  
 755 760 765

Gly Ser Val Glu Val Glu Tyr Val Glu Asp Ser Gly Phe Leu Thr Arg  
 770 775 780

Arg Arg Phe Pro Ser Leu Arg Lys Leu His Ile Gly Gly Phe Cys Asn  
 785 790 795 800

Leu Lys Gly Leu Gln Arg Met Lys Gly Ala Glu Gln Phe Pro Val Leu  
 805 810 815

Glu Glu Met Lys Ile Ser Asp Cys Pro Met Phe Val Phe Pro Thr Leu  
 820 825 830

Ser Ser Val Lys Lys Leu Glu Ile Trp Gly Glu Ala Asp Ala Gly Gly  
 835 840 845



Leu Ser Ser Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Lys Ile Phe  
850 855 860

Ser Asn His Thr Val Thr Ser Leu Leu Glu Glu Met Phe Lys Asn Leu  
865 870 875 880

Glu Asn Leu Ile Tyr Leu Ser Val Ser Phe Leu Glu Asn Leu Lys Glu  
885 890 895

Leu Pro Thr Ser Leu Ala Ser Leu Asn Asn Leu Lys Cys Leu Asp Ile  
900 905 910

Arg Tyr Cys Tyr Ala Leu Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly  
915 920 925

Leu Ser Ser Leu Thr Glu Leu Phe Val Glu His Cys Asn Met Leu Lys  
930 935 940

Cys Leu Pro Glu Gly Leu Gln His Leu Thr Thr Leu Thr Ser Leu Lys  
945 950 955 960

Ile Arg Gly Cys Pro Gln Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly  
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Glu Asp Trp His Lys Ile Ser His Ile Pro Asn Val Asn Ile Tyr Ile  
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1 5 10 15  
atc gga gat aaa ctt gta ttg att ttc ggt ttc gaa aag gaa tgt gaa 96  
Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu  
20 25 30  
aag ctg tcg agt gtg ttt tcc aca att caa gct gtg ctt caa gat gct 144  
Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Leu Gln Asp Ala  
35 40 45  
cag gag aag caa ttg aag gac aag gca att gag aat tgg ttg cag aaa 192  
Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys  
50 55 60  
ctc aat tct gct gcc tat gaa gtt gat gat ata ttg ggc gaa tgt aaa 240  
Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys  
65 70 75 80  
aat gag gca ata aga ttt gag cag tct cga tta ggg ttt tat cac cca 288

WARF0235.ST25.txt

Asn	Glu	Ala	Ile	Arg	Phe	Glu	Gln	Ser	Arg	Leu	Gly	Phe	Tyr	His	Pro		
				85					90					95			
ggg	att	atc	aat	ttc	cgt	cac	aaa	att	ggg	aga	agg	atg	aaa	gag	ata	336	
Gly	Ile	Ile	Asn	Phe	Arg	His	Lys	Ile	Gly	Arg	Arg	Met	Lys	Glu	Ile		
			100					105					110				
atg	gag	aaa	cta	gat	gca	ata	tct	gag	gaa	aga	agg	aag	ttt	cat	ttc	384	
Met	Glu	Lys	Leu	Asp	Ala	Ile	Ser	Glu	Glu	Arg	Arg	Lys	Phe	His	Phe		
		115					120					125					
ctt	gaa	aaa	att	aca	gag	aga	caa	gct	gcc	gct	gct	acg	cgt	gaa	aca	432	
Leu	Glu	Lys	Ile	Thr	Glu	Arg	Gln	Ala	Ala	Ala	Ala	Thr	Arg	Glu	Thr		
	130						135					140					
ggg	ttt	gtg	tta	act	gaa	cca	aaa	gtc	tac	gga	agg	gac	aaa	gag	gag	480	
Gly	Phe	Val	Leu	Thr	Gly	Pro	Lys	Val	Tyr	Gly	Arg	Asp	Lys	Glu	Glu		
	145					150				155					160		
gat	gag	ata	gtg	aaa	att	ctg	ata	aac	aat	ggt	aat	ggt	gcc	gaa	gaa	528	
Asp	Glu	Ile	Val	Lys	Ile	Leu	Ile	Asn	Asn	Val	Asn	Val	Ala	Glu	Glu		
			165						170					175			
ctt	cca	gtc	ttc	cct	ata	att	ggg	atg	ggg	gga	cta	gga	aag	acg	aca	576	
Leu	Pro	Val	Phe	Pro	Ile	Ile	Gly	Met	Gly	Gly	Leu	Gly	Lys	Thr	Thr		
			180					185					190				
ctt	gcc	caa	atg	atc	ttc	aac	gat	gag	aga	gta	act	aag	cat	ttc	aat	624	
Leu	Ala	Gln	Met	Ile	Phe	Asn	Asp	Glu	Arg	Val	Thr	Lys	His	Phe	Asn		
		195					200					205					
ccc	aaa	ata	tgg	gtt	tgt	gtc	tca	gat	gat	ttt	gat	gag	aag	agg	tta	672	
Pro	Lys	Ile	Trp	Val	Cys	Val	Ser	Asp	Asp	Phe	Asp	Glu	Lys	Arg	Leu		
	210					215					220						
att	aag	aca	att	ata	gga	aat	att	gaa	aga	agt	tct	cct	cat	gtt	gag	720	
Ile	Lys	Thr	Ile	Ile	Gly	Asn	Ile	Glu	Arg	Ser	Ser	Pro	His	Val	Glu		
	225				230					235					240		
gac	ttg	gct	tca	ttt	cag	aag	aag	ctc	cag	gag	tta	ttg	aat	gga	aaa	768	
Asp	Leu	Ala	Ser	Phe	Gln	Lys	Lys	Leu	Gln	Glu	Leu	Leu	Asn	Gly	Lys		
			245						250					255			
cga	tac	ttg	ctt	gtc	tta	gat	gat	gtt	tgg	aat	gat	gat	cta	gaa	aag	816	
Arg	Tyr	Leu	Leu	Val	Leu	Asp	Asp	Val	Trp	Asn	Asp	Asp	Leu	Glu	Lys		
			260					265					270				
tgg	gct	aag	tta	aga	gca	gtc	tta	act	gtt	gga	gca	aga	ggg	gct	tct	864	
Trp	Ala	Lys	Leu	Arg	Ala	Val	Leu	Thr	Val	Gly	Ala	Arg	Gly	Ala	Ser		
		275					280					285					
att	cta	gct	act	act	cgt	ctt	gaa	aag	gtt	gga	tca	att	atg	gga	acg	912	
Ile	Leu	Ala	Thr	Thr	Arg	Leu	Glu	Lys	Val	Gly	Ser	Ile	Met	Gly	Thr		
	290					295					300						
ttg	caa	cca	tat	cat	ttg	tca	aat	ttg	tct	cca	cat	gat	agt	tta	ctt	960	
Leu	Gln	Pro	Tyr	His	Leu	Ser	Asn	Leu	Ser	Pro	His	Asp	Ser	Leu	Leu		
	305				310					315					320		
ttg	ttt	atg	caa	cgc	gca	ttt	ggg	caa	caa	aaa	gaa	gca	aat	cct	aat	1008	
Leu	Phe	Met	Gln	Arg	Ala	Phe	Gly	Gln	Gln	Lys	Glu	Ala	Asn	Pro	Asn		
			325					330					335				
cta	gtg	gcc	att	gga	aag	gag	att	gtg	aag	aaa	tgt	ggg	ggg	gtg	cct	1056	
Leu	Val	Ala	Ile	Gly	Lys	Glu	Ile	Val	Lys	Lys	Cys	Gly	Gly	Val	Pro		
			340					345					350				
tta	gca	gcc	aag	act	ctt	ggg	ggg	ctt	tta	cgc	ttc	aag	aga	gaa	gag	1104	
Leu	Ala	Ala	Lys	Thr	Leu	Gly	Gly	Leu	Leu	Arg	Phe	Lys	Arg	Glu	Glu		
		355				360						365					

## WARF0235.ST25.txt

agt gaa tgg gaa cat gtg aga gat aat gag att tgg agt ctg cct caa Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln 370 375 380	1152
gat gaa agt tct att ttg cct gct cta aga ctg agt tat cat cac ctt Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu 385 390 395 400	1200
cca ctt gat ttg aga caa tgc ttt gcg tat tgt gca gta ttc cca aag Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys 405 410 415	1248
gac acc aaa atg ata aag gaa aat ctc att act ctc tgg atg gcg cat Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His 420 425 430	1296
ggg ttt ctt tta tca aag gga aac ttg gag cta gag gat gtg ggt aat Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn 435 440 445	1344
gaa gta tgg aat gaa tta tac ttg agg tct ttc ttc caa gaa att gaa Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu 450 455 460	1392
gct aaa tcg ggt aat act tat ttc aag ata cat gat cta atc cat gat Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp 465 470 475 480	1440
ttg gct aca tct ctg ttt tcg gca agc gca tca tgc ggc aat atc cgc Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg 485 490 495	1488
gaa ata aat gtc aaa gat tat aag cat aca gtg tcc att ggt ttc gct Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ala 500 505 510	1536
gca gtg gtg tct tct tac tct cct tcg ctc ttg aaa aag ttt gtc tcg Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser 515 520 525	1584
tta agg gtg ctt aat cta agt tac tca aaa ctt gag caa tta ccg tct Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser 530 535 540	1632
tcc att gga gat cta tta cat tta aga tac ctg gac ctg tct tgc aat Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn 545 550 555 560	1680
aac ttc cgt agt ctt cca gag agg ttg tgc aag ctt caa aat ctt cag Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln 565 570 575	1728
act ctt gat gta cat aat tgc tac tca ctt aat tgt ttg cca aaa caa Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln 580 585 590	1776
aca agt aaa ctt agt agt ctc cga cat ctt gtt gtt gat ggc tgt cca Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro 595 600 605	1824
ttg act tct act cca cca agg ata gga ttg ttg aca tgc ctt aag act Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr 610 615 620	1872
cta ggt ttc ttt att gtg gga agc aag aaa ggt tat caa ctt ggt gaa Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640	1920
ctg aaa aac cta aat ctc tgc ggc tca att tca atc aca cac ctt gag	1968

## WARF0235.ST25.txt

Leu	Lys	Asn	Leu	Asn	Leu	Cys	Gly	Ser	Ile	Ser	Ile	Thr	His	Leu	Glu		
				645					650					655			
aga	gtg	aag	aac	gat	acg	gat	gca	gaa	gcc	aat	tta	tct	gca	aaa	gca	2016	
Arg	Val	Lys	Asn	Asp	Thr	Asp	Ala	Glu	Ala	Asn	Leu	Ser	Ala	Lys	Ala		
			660					665					670				
aat	ctg	caa	tct	tta	agc	atg	agt	tgg	gat	aac	gat	gga	cca	aac	aga	2064	
Asn	Leu	Gln	Ser	Leu	Ser	Met	Lys	Trp	Asp	Asn	Asp	Gly	Pro	Asn	Arg		
		675					680					685					
tat	gaa	tcc	aaa	gaa	gtt	aaa	gtg	ctt	gaa	gca	ctc	aaa	cca	cac	ccc	2112	
Tyr	Glu	Ser	Lys	Glu	Val	Lys	Val	Leu	Glu	Ala	Leu	Lys	Pro	His	Pro		
	690					695					700						
aat	ctg	aaa	tat	tta	gag	atc	att	gcc	ttc	gga	gga	ttc	cgt	ttt	cca	2160	
Asn	Leu	Lys	Tyr	Leu	Glu	Ile	Ile	Ala	Phe	Gly	Gly	Phe	Arg	Phe	Pro		
705					710				715						720		
agc	tgg	ata	aat	cac	tca	gtt	ttg	gag	aag	gtc	atc	tct	gtt	aga	att	2208	
Ser	Trp	Ile	Asn	His	Ser	Val	Leu	Glu	Lys	Val	Ile	Ser	Val	Arg	Ile		
			725						730					735			
aaa	agc	tgc	aaa	aac	tgc	ttg	tgc	tta	cca	ccc	ttt	ggg	gag	ctt	cct	2256	
Lys	Ser	Cys	Lys	Asn	Cys	Leu	Cys	Leu	Pro	Pro	Phe	Gly	Glu	Leu	Pro		
			740					745					750				
tgt	cta	gaa	aat	cta	gag	tta	caa	aac	gga	tct	gcg	gag	gtg	gag	tat	2304	
Cys	Leu	Glu	Asn	Leu	Glu	Leu	Asn	Gly	Ser	Ala	Glu	Val	Glu	Tyr			
		755				760						765					
gtt	gaa	gag	gat	gat	gtc	cat	tct	aga	ttc	tcc	aca	aga	aga	agc	ttt	2352	
Val	Glu	Glu	Asp	Asp	Val	His	Ser	Arg	Phe	Ser	Thr	Arg	Arg	Ser	Phe		
	770					775					780						
cca	tcc	ctg	aaa	aaa	ctt	cgt	ata	tgg	ttc	ttt	cgc	agt	ttg	aaa	ggg	2400	
Pro	Ser	Leu	Lys	Lys	Leu	Arg	Ile	Trp	Phe	Phe	Arg	Ser	Leu	Lys	Gly		
785					790					795					800		
ctg	atg	aaa	gag	gaa	gga	gaa	gag	aaa	ttc	ccc	atg	ctt	gaa	gag	atg	2448	
Leu	Met	Lys	Glu	Glu	Gly	Glu	Glu	Lys	Phe	Pro	Met	Leu	Glu	Glu	Met		
				805					810					815			
gcg	att	tta	tat	tgc	cct	ctg	ttt	gtt	ttt	cca	acc	ctt	tct	tct	gtc	2496	
Ala	Ile	Leu	Tyr	Cys	Pro	Leu	Phe	Val	Phe	Pro	Thr	Leu	Ser	Ser	Val		
			820					825					830				
aag	aaa	tta	gaa	gtt	cac	ggc	aac	aca	aac	act	aga	ggt	ttg	agc	tcc	2544	
Lys	Lys	Leu	Glu	Val	His	Gly	Asn	Thr	Asn	Thr	Arg	Gly	Leu	Ser	Ser		
		835					840					845					
ata	tct	aat	ctt	agc	act	ctt	act	tcc	ctc	cgc	att	ggt	gct	aac	tac	2592	
Ile	Ser	Asn	Leu	Ser	Thr	Leu	Thr	Ser	Leu	Arg	Ile	Gly	Ala	Asn	Tyr		
	850					855					860						
aga	gcg	act	tca	ctc	cca	gaa	gag	atg	ttc	aca	agt	ctt	aca	aat	ctc	2640	
Arg	Ala	Thr	Ser	Leu	Pro	Glu	Glu	Met	Phe	Thr	Ser	Leu	Thr	Asn	Leu		
	865				870					875					880		
gaa	ttc	ttg	agt	ttc	ttt	gac	ttc	aag	aat	ctc	aaa	gat	ctg	cct	acc	2688	
Glu	Phe	Leu	Ser	Phe	Phe	Asp	Phe	Lys	Asn	Leu	Lys	Asp	Leu	Pro	Thr		
				885					890					895			
agc	ctg	act	agt	ctc	aat	gct	ttg	aag	cgt	ctc	caa	att	gaa	agt	tgt	2736	
Ser	Leu	Thr	Ser	Leu	Asn	Ala	Leu	Lys	Arg	Leu	Gln	Ile	Glu	Ser	Cys		
			900					905					910				
gac	tca	cta	gag	agt	ttc	cct	gaa	caa	ggg	cta	gaa	ggt	tta	act	tca	2784	
Asp	Ser	Leu	Glu	Ser	Phe	Pro	Glu	Gln	Gly	Leu	Glu	Gly	Leu	Thr	Ser		
		915					920					925					

## WARF0235.ST25.txt

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ctc aca cag ttg ttt gtt aaa tac tgt aag atg cta aaa tgt tta ccc      2832
Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro
  930                               935                               940

gag gga ttg cag cac cta aca gcc ctc aca aat tta gga gtt tct ggt      2880
Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly
  945                               950                               955                               960

tgt cca gaa gtg gaa aag cgc tgt gat aag gaa ata gga gaa gac tgg      2928
Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp
                               965                               970                               975

cac aaa att gct cac att cca aat ctg gat att cat tag      2967
His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His
      980                               985

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<213> Solanum bulbocastanum

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Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu
      20                               25                               30

Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Leu Gln Asp Ala
      35                               40                               45

Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys
      50                               55                               60

Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys
      65                               70                               75                               80

Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro
      85                               90                               95

Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile
      100                               105                               110

Met Glu Lys Leu Asp Ala Ile Ser Glu Glu Arg Arg Lys Phe His Phe
      115                               120                               125

Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Ala Thr Arg Glu Thr
      130                               135                               140

Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu
      145                               150                               155                               160

Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu
      165                               170                               175

Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr

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180

185

190

Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn  
 195 200 205

Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu  
 210 215 220

Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu  
 225 230 235 240

Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys  
 245 250 255

Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys  
 260 265 270

Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser  
 275 280 285

Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr  
 290 295 300

Leu Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu  
 305 310 315 320

Leu Phe Met Gln Arg Ala Phe Gly Gln Gln Lys Glu Ala Asn Pro Asn  
 325 330 335

Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro  
 340 345 350

Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu  
 355 360 365

Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln  
 370 375 380

Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu  
 385 390 395 400

Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys  
 405 410 415

Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His  
 420 425 430

Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn  
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Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu  
 450 455 460

## WARF0235.ST25.txt

Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp  
 465 470 475 480  
 Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg  
 485 490 495  
 Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ala  
 500 505 510  
 Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser  
 515 520 525  
 Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser  
 530 535 540  
 Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn  
 545 550 555 560  
 Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln  
 565 570 575  
 Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln  
 580 585 590  
 Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro  
 595 600 605  
 Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr  
 610 615 620  
 Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu  
 625 630 635 640  
 Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu  
 645 650 655  
 Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala  
 660 665 670  
 Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg  
 675 680 685  
 Tyr Glu Ser Lys Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro  
 690 695 700  
 Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro  
 705 710 715 720  
 Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile  
 725 730 735  
 Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro

740

745

750

Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr  
 755 760 765

Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe  
 770 775 780

Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly  
 785 790 795 800

Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met  
 805 810 815

Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val  
 820 825 830

Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser  
 835 840 845

Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr  
 850 855 860

Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu  
 865 870 875 880

Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr  
 885 890 895

Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys  
 900 905 910

Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser  
 915 920 925

Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro  
 930 935 940

Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly  
 945 950 955 960

Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp  
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His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His  
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<220>



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&lt;222&gt; (1)..(1920)

&lt;400&gt; 13

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ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa	96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln	
20 25 30	
agg ctt tca agc atg ttt tct aca atc caa gcc gtc ctt gaa gat gct	144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala	
35 40 45	
caa gag aag caa ctc aac gac aag cct cta gaa aat tgg ttg caa aaa	192
Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys	
50 55 60	
ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa	240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys	
65 70 75 80	
act aag gcc aca aga ttc ttg ctg tct gaa tat ggc cgt tat cat cca	288
Thr Lys Ala Thr Arg Phe Leu Leu Ser Glu Tyr Gly Arg Tyr His Pro	
85 90 95	
aag gtt atc cct ttc cgt cac aag gtt ggg aaa agg atg gac caa gtg	336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val	
100 105 110	
atg aaa aaa ctg aat gca att gct gag gaa cga aag aat ttt cat ttg	384
Met Lys Lys Leu Asn Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu	
115 120 125	
caa gaa aag att ata gag aga caa gct gct aca cgg gaa aca ggt tct	432
Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser	
130 135 140	
gtg tta act gaa tca caa gtt tat gga agg gac aaa gaa aaa gat gag	480
Val Leu Thr Glu Ser Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu	
145 150 155 160	
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Ile Val Lys Ile Leu Thr Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser	
165 170 175	
gtc ctc cca ata ctt ggt atg ggg gga cta gga aag acg act ctt tcc	576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser	
180 185 190	
caa atg gtc ttc aat gat cag aga gta act gag cgt ttc tat ccc aaa	624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys	
195 200 205	
ata tgg att tgc gtc tcg gat gat ttt aat gag aag agg ttg ata aag	672
Ile Trp Ile Cys Val Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys	
210 215 220	
gca ata gta gaa tct att gaa ggg aag tcc ctc agt gac atg gac ttg	720
Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu	
225 230 235 240	
gct cca ctt caa aag aag ctt caa gag ttg ctg aat gga aaa aga tac	768
Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr	
245 250 255	
ttc ctt gtc tta gat gat gtt tgg aat gaa gat caa cat aag tgg gct	816
Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala	

## WARF0235.ST25.txt

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cca tat gaa ttg tca aat ctg tct cca gag gat tgt tgg ttt ttg ttc Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe 305 310 315 320			960
atg cag cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt gtg Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Val 325 330 335			1008
gca atc gga aag gag att gtg aaa aaa tgt ggt ggt gtg cct cta gca Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala 340 345 350			1056
gcc aag act ctt gga ggt att ttg cgc ttc aag aga gaa gaa aga gaa Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu 355 360 365			1104
tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat gaa Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu 370 375 380			1152
agt tct att ctg cct gcc ctg agg ctt agt tac cat cat ctt cca ctt Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu 385 390 395 400			1200
gat ttg aga caa tgc ttt gtg tat tgt gcg gta ttc cca aag gac acc Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr 405 410 415			1248
aaa atg gca aag gaa aat ctt atc gct ttt tgg atg gca cat ggt ttt Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe 420 425 430			1296
ctt tta tcg aaa gga aat ttg gag cta gag gat gta ggt aat gaa gta Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val 435 440 445			1344
tgg aat gaa tta tac ttg agg tct ttc ttc caa gag att gaa gtt gaa Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu 450 455 460			1392
tct ggt aaa act tat ttc aag atg cat gac ctc atc cat gat ttg gct Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala 465 470 475 480			1440
acg tct ctg ttt tca gca aac aca tca agc agc aat att cgt gaa ata Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile 485 490 495			1488
aat gct aat tat gat gga tat atg atg tcg att ggt ttc gct gaa gtg Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val 500 505 510			1536
gtg tct tct tac tct cct tca ctc ttg caa aag ttt gtc tca tta agg Val Ser Ser Tyr Ser Pro Ser Leu Gln Lys Phe Val Ser Leu Arg 515 520 525			1584
gtg ctt aat cta aga aac tcg aac cta aat caa tta cca tct tcc att Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile 530 535 540			1632

## WARF0235.ST25.txt

gga gat cta gta cat tta aga tac ctg gac ttg tct ggc aat gtt aga 1680  
 Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Val Arg  
 545 550 555 560

att cgt agt ctt cca agg aga tta tgc aag ctt caa aat ctg cag act 1728  
 Ile Arg Ser Leu Pro Arg Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr  
 565 570 575

ctt gat cta cat tat tgc gac tct ctt tct tgt ttg cca aaa caa aca 1776  
 Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr  
 580 585 590

agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggc tgt tca ttg 1824  
 Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu  
 595 600 605

acg tca acg cca cca agg ata gga ttg ttg aca tgc ctt aag tct cta 1872  
 Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu  
 610 615 620

agt tgc ttt gtt att ggc aag aga aag gtt atc aac ttg gtg aac taa 1920  
 Ser Cys Phe Val Ile Gly Lys Arg Lys Val Ile Asn Leu Val Asn  
 625 630 635

<210> 14

<211> 639

<212> PRT

<213> Solanum bulbocastanum

<400> 14

Met Ala Glu Ala Phe Ile Gln Val Val Leu Asp Asn Leu Thr Ser Phe  
 1 5 10 15

Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
 20 25 30

Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45

Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80

Thr Lys Ala Thr Arg Phe Leu Leu Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
 100 105 110

Met Lys Lys Leu Asn Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
 115 120 125

Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser  
 130 135 140

Val Leu Thr Glu Ser Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
 145 150 155 160

```

Ile Val Lys Ile Leu Thr Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser
      165                      170                      175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser
      180                      185                      190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys
      195                      200                      205

Ile Trp Ile Cys Val Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys
      210                      215                      220

Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu
      225                      230                      235                      240

Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr
      245                      250                      255

Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala
      260                      265                      270

Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Phe Val Leu
      275                      280                      285

Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu Gln
      290                      295                      300

Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe
      305                      310                      315                      320

Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Val
      325                      330                      335

Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
      340                      345                      350

Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu
      355                      360                      365

Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu
      370                      375                      380

Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
      385                      390                      395                      400

Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr
      405                      410                      415

Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe
      420                      425                      430

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## WARF0235.ST25.txt

Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val  
 435 440 445

Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu  
 450 455 460

Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala  
 465 470 475 480

Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile  
 485 490 495

Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val  
 500 505 510

Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg  
 515 520 525

Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile  
 530 535 540

Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Val Arg  
 545 550 555 560

Ile Arg Ser Leu Pro Arg Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr  
 565 570 575

Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr  
 580 585 590

Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu  
 595 600 605

Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu  
 610 615 620

Ser Cys Phe Val Ile Gly Lys Arg Lys Val Ile Asn Leu Val Asn  
 625 630 635

<210> 15  
 <211> 879  
 <212> DNA  
 <213> Solanum bulbocastanum

<220>  
 <221> CDS  
 <222> (1)..(879)

<400> 15  
 atg tgg aca ttg ctt gga cca ggt tct gtt tta act gaa cca caa gtt 48  
 Met Trp Thr Leu Leu Gly Pro Gly Ser Val Leu Thr Glu Pro Gln Val  
 1 5 10 15  
 tat gga agg gac aaa gaa aag gac gag ata gtg aaa atc ctg ata aac 96  
 Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val Lys Ile Leu Ile Asn  
 20 25 30

## WARF0235.ST25.txt

aat gtt agt gat gct caa gaa gtt tca gtc ctc cca ata gtt ggt atg Asn Val Ser Asp Ala Gln Glu Val Ser Val Leu Pro Ile Val Gly Met 35 40 45	144
ggg gga cta gga aag acg act ctt gcc caa atg gtc ttc aat gat cag Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln 50 55 60	192
aca gta act gag cat ttg tat ccg aaa ata tgg att tgt gtc tcc aat Thr Val Thr Glu His Leu Tyr Pro Lys Ile Trp Ile Cys Val Ser Asn 65 70 75 80	240
gat ttt gat gag aag agg tta ata aag gca att gta gaa tct att gaa Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu 85 90 95	288
gga agg cca cta ctt ggt gag atg gac ttg gct cca ctt caa aag aag Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala Pro Leu Gln Lys Lys 100 105 110	336
ctt caa gag ttg cgg atg tgg agt atg ttg aag aag tgg ata ttg atg Leu Gln Glu Leu Arg Met Trp Ser Met Leu Lys Lys Trp Ile Leu Met 115 120 125	384
ttc att ctg gat ttc ccc aca aga ata agg ttt cca tcc ttg agg aaa Phe Ile Leu Asp Phe Pro Thr Arg Ile Arg Phe Pro Ser Leu Arg Lys 130 135 140	432
ctt gat ata tgg gac ttt ggt agt ctg aaa gga ttg ctg aaa aag gaa Leu Asp Ile Trp Asp Phe Gly Ser Leu Lys Gly Leu Leu Lys Lys Glu 145 150 155 160	480
gga gaa gag caa ttc cct gtg ctt gaa gag atg gag att aaa tgg tgc Gly Glu Glu Gln Phe Pro Val Leu Glu Glu Met Glu Ile Lys Trp Cys 165 170 175	528
cct atg ttt gtt att ccg acc ctt tct tct gtc aag aaa ttg gta gtt Pro Met Phe Val Ile Pro Thr Leu Ser Ser Val Lys Lys Leu Val Val 180 185 190	576
cgt ggg gac aag tca gat gca ata ggt ttc agt tcc ata tct aat ctc Arg Gly Asp Lys Ser Asp Ala Ile Gly Phe Ser Ser Ile Ser Asn Leu 195 200 205	624
agg gct ctt act tcc ctc aat att aac ttt aac aaa gaa gct act tca Arg Ala Leu Thr Ser Leu Asn Ile Asn Phe Asn Lys Glu Ala Thr Ser 210 215 220	672
ctc cca gaa gag atg ttc aaa agc ctt gca aat ctc aaa tac ttg aaa Leu Pro Glu Glu Met Phe Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys 225 230 235 240	720
atc tct tcc ttt agg aat ctc aaa gag ctg cct acc agc ctg gct agt Ile Ser Ser Phe Arg Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser 245 250 255	768
ctc aat gct ttg cag agt ctg aca att gaa cat tgt gac gca cta gag Leu Asn Ala Leu Gln Ser Leu Thr Ile Glu His Cys Asp Ala Leu Glu 260 265 270	816
agt ctc cca gaa gaa ggg gtg aaa ggt tta act tca ctc acc gag ttg Ser Leu Pro Glu Glu Gly Val Lys Gly Leu Thr Ser Leu Thr Glu Leu 275 280 285	864
tct gtc cag gac tga Ser Val Gln Asp 290	879

&lt;210&gt; 16

&lt;211&gt; 292

&lt;212&gt; PRT

&lt;213&gt; Solanum bulbocastanum

&lt;400&gt; 16

Met Trp Thr Leu Leu Gly Pro Gly Ser Val Leu Thr Glu Pro Gln Val  
 1 5 10 15

Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val Lys Ile Leu Ile Asn  
 20 25 30

Asn Val Ser Asp Ala Gln Glu Val Ser Val Leu Pro Ile Val Gly Met  
 35 40 45

Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln  
 50 55 60

Thr Val Thr Glu His Leu Tyr Pro Lys Ile Trp Ile Cys Val Ser Asn  
 65 70 75 80

Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu  
 85 90 95

Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala Pro Leu Gln Lys Lys  
 100 105 110

Leu Gln Glu Leu Arg Met Trp Ser Met Leu Lys Lys Trp Ile Leu Met  
 115 120 125

Phe Ile Leu Asp Phe Pro Thr Arg Ile Arg Phe Pro Ser Leu Arg Lys  
 130 135 140

Leu Asp Ile Trp Asp Phe Gly Ser Leu Lys Gly Leu Leu Lys Lys Glu  
 145 150 155 160

Gly Glu Glu Gln Phe Pro Val Leu Glu Glu Met Glu Ile Lys Trp Cys  
 165 170 175

Pro Met Phe Val Ile Pro Thr Leu Ser Ser Val Lys Lys Leu Val Val  
 180 185 190

Arg Gly Asp Lys Ser Asp Ala Ile Gly Phe Ser Ser Ile Ser Asn Leu  
 195 200 205

Arg Ala Leu Thr Ser Leu Asn Ile Asn Phe Asn Lys Glu Ala Thr Ser  
 210 215 220

Leu Pro Glu Glu Met Phe Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys  
 225 230 235 240

Ile Ser Ser Phe Arg Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser  
 245 250 255

## WARF0235.ST25.txt

Leu Asn Ala Leu Gln Ser Leu Thr Ile Glu His Cys Asp Ala Leu Glu  
 260 265 270

Ser Leu Pro Glu Glu Gly Val Lys Gly Leu Thr Ser Leu Thr Glu Leu  
 275 280 285

Ser Val Gln Asp  
 290

<210> 17  
 <211> 1362  
 <212> DNA  
 <213> Solanum bulbocastanum

<220>  
 <221> CDS  
 <222> (1)..(1362)

<400> 17  
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 Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe  
 1 5 10 15  
 ctc aaa ggg gaa ctt gca ttg ctt ttc ggt ttt caa gat gag ttc caa 96  
 Leu Lys Gly Glu Leu Ala Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
 20 25 30  
 agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct 144  
 Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45  
 cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa 192  
 Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60  
 ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa 240  
 Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80  
 acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca 288  
 Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95  
 aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg 336  
 Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
 100 105 110  
 atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg 384  
 Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
 115 120 125  
 cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct 432  
 His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser  
 130 135 140  
 gta tta acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag 480  
 Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
 145 150 155 160  
 ata gtg aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca 528  
 Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser  
 165 170 175  
 gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc 576  
 Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala



## WARF0235.ST25.txt

180	185	190	
caa atg gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys 195 200 205			624
ata tgg att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys 210 215 220			672
gca att gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp 225 230 235 240			720
ttg gct cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg 245 250 255			768
tac ttg ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp 260 265 270			816
gct aat tta aga gca gtc ttg aag gtt gga gca agt ggt gct tct gtt Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val 275 280 285			864
cta acc act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu 290 295 300			912
caa cca tat gaa ctg tca aat ctg tct caa gaa gat tgt tgg ttg ttg Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu 305 310 315 320			960
ttc atg caa cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu 325 330 335			1008
gtg gca atc gga aag gag att gtg aaa aaa agt ggt ggt gtg cct cta Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu 340 345 350			1056
gca gcc aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg 355 360 365			1104
gca tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp 370 375 380			1152
gaa agt tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro 385 390 395 400			1200
ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp 405 410 415			1248
gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly 420 425 430			1296
ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu 435 440 445			1344
gta tgg aaa gaa tta tag Val Trp Lys Glu Leu 450			1362

<210> 18  
 <211> 453  
 <212> PRT  
 <213> Solanum bulbocastanum

<400> 18

Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe  
 1 5 10 15

Leu Lys Gly Glu Leu Ala Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln  
 20 25 30

Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala  
 35 40 45

Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys  
 50 55 60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys  
 65 70 75 80

Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro  
 85 90 95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val  
 100 105 110

Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu  
 115 120 125

His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser  
 130 135 140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu  
 145 150 155 160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser  
 165 170 175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala  
 180 185 190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys  
 195 200 205

Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys  
 210 215 220

Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp  
 225 230 235 240

Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg  
 245 250 255

Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp  
260 265 270

Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val  
275 280 285

Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu  
290 295 300

Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu  
305 310 315 320

Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu  
325 330 335

Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu  
340 345 350

Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg  
355 360 365

Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp  
370 375 380

Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro  
385 390 395 400

Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp  
405 410 415

Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly  
420 425 430

Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu  
435 440 445

Val Trp Lys Glu Leu  
450

<210> 19  
<211> 3096  
<212> DNA  
<213> Solanum bulbocastanum

<220>  
<221> CDS  
<222> (1)..(3096)

<400> 19  
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Met Trp Leu Ser Thr Phe Pro Thr Ala Leu Ala Val Ala Val Ser Val  
1 5 10 15  
cct tcc tct ctt act cca cag gat ttc agc tgg aga aag ttt aaa ttg 96

## WARF0235.ST25.txt

Pro	Ser	Ser	Leu	Thr	Pro	Gln	Asp	Phe	Ser	Trp	Arg	Lys	Phe	Lys	Leu	
			20					25					30			
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Lys	Arg	Asn	Val	Lys	Ile	Ser	Arg	Asn	Phe	Glu	Phe	Ala	Ile	Ser	Cys	
		35					40					45				
tct	ggg	gat	aga	gct	gct	tca	att	ggg	ttt	gat	gtg	cca	ttc	cct	aag	192
Ser	Gly	Asp	Arg	Ala	Ala	Ser	Ile	Gly	Phe	Asp	Val	Pro	Phe	Pro	Lys	
	50					55					60					
gac	tac	act	gaa	tta	ctt	caa	caa	gta	ttc	att	cta	ttt	gct	ttt	tct	240
Asp	Tyr	Thr	Glu	Leu	Leu	Gln	Gln	Val	Phe	Ile	Leu	Phe	Ala	Phe	Ser	
	65				70					75					80	
ccc	ctt	aaa	att	ggg	ggg	gac	ggg	gag	ggg	gga	ata	gaa	atg	act	gga	288
Pro	Leu	Lys	Ile	Gly	Gly	Asp	Gly	Glu	Gly	Gly	Ile	Glu	Met	Thr	Gly	
				85					90					95		
agt	ata	caa	ctc	ata	cgt	gag	ttc	tgt	gat	ctc	ttg	gta	ata	cct	gag	336
Ser	Ile	Gln	Leu	Ile	Arg	Glu	Phe	Cys	Asp	Leu	Leu	Val	Ile	Pro	Glu	
			100					105					110			
aaa	gcc	aca	aag	acc	aga	att	ttt	ttc	ccg	gag	gct	aat	gaa	gtg	aaa	384
Lys	Ala	Thr	Lys	Thr	Arg	Ile	Phe	Phe	Pro	Glu	Ala	Asn	Glu	Val	Lys	
		115					120					125				
ttt	gca	aga	caa	tca	att	ttt	gga	gga	gca	tct	ttt	aag	ttg	gac	tat	432
Phe	Ala	Arg	Gln	Ser	Ile	Phe	Gly	Gly	Ala	Ser	Phe	Lys	Leu	Asp	Tyr	
	130					135					140					
ttg	aca	aag	cct	tct	ttt	ttc	gag	gat	ttc	ggg	ttc	act	gaa	aag	gtc	480
Leu	Thr	Lys	Pro	Ser	Phe	Phe	Glu	Asp	Phe	Gly	Phe	Thr	Glu	Lys	Val	
	145				150					155					160	
aag	atg	gct	gac	cgt	gtc	aag	cca	gaa	gat	gaa	ctc	ttt	ata	gtc	gcc	528
Lys	Met	Ala	Asp	Arg	Val	Lys	Pro	Glu	Asp	Glu	Leu	Phe	Ile	Val	Ala	
				165					170					175		
tat	cca	tat	ttt	aat	gtc	aat	ggg	gaa	ctt	gga	ttg	gtt	ttt	ggg	ttc	576
Tyr	Pro	Tyr	Phe	Asn	Val	Asn	Gly	Glu	Leu	Gly	Leu	Val	Phe	Gly	Phe	
			180				185						190			
gag	aag	gag	ttt	aaa	aaa	ctt	tca	agt	atg	ttt	tca	atg	atc	caa	gct	624
Glu	Lys	Glu	Phe	Lys	Lys	Leu	Ser	Ser	Met	Phe	Ser	Met	Ile	Gln	Ala	
		195					200					205				
gtg	cta	gaa	gat	gct	caa	gag	aag	caa	ctg	aag	tac	aag	gca	ata	aag	672
Val	Leu	Glu	Asp	Ala	Gln	Glu	Lys	Gln	Leu	Lys	Tyr	Lys	Ala	Ile	Lys	
	210					215					220					
aac	tgg	tta	cag	aaa	ctc	aat	gtt	gct	gca	tat	gaa	gtt	gat	gac	atc	720
Asn	Trp	Leu	Gln	Lys	Leu	Asn	Val	Ala	Ala	Tyr	Glu	Val	Asp	Asp	Ile	
	225				230					235					240	
ttg	gat	gac	tgt	aaa	act	gag	gca	gca	aga	ttc	aag	cag	gct	gta	ttg	768
Leu	Asp	Asp	Cys	Lys	Thr	Glu	Ala	Ala	Arg	Phe	Lys	Gln	Ala	Val	Leu	
				245					250					255		
ggg	cgt	tat	cat	cca	cgg	acc	atc	act	ttc	tgt	tac	aag	gtg	gga	aaa	816
Gly	Arg	Tyr	His	Pro	Arg	Thr	Ile	Thr	Phe	Cys	Tyr	Lys	Val	Gly	Lys	
			260					265					270			
aga	atg	aaa	gaa	atg	atg	gaa	aaa	cta	gat	gca	att	gca	gag	gaa	cgg	864
Arg	Met	Lys	Glu	Met	Met	Glu	Lys	Leu	Asp	Ala	Ile	Ala	Glu	Glu	Arg	
		275					280					285				
agg	aat	ttt	cat	tta	gat	gaa	agg	att	ata	gag	aga	caa	gct	gct	aga	912
Arg	Asn	Phe	His	Leu	Asp	Glu	Arg	Ile	Ile	Glu	Arg	Gln	Ala	Ala	Arg	
	290					295					300					

## WARF0235.ST25.txt

cgg caa aca ggt ttt gtt tta act gag cca aaa gtt tat gga aag gaa Arg Gln Thr Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Lys Glu 305 310 315 320	960
aaa gag gag gat gag ata gtg aaa atc ttg ata aac aat gtt agt tat Lys Glu Glu Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr 325 330 335	1008
tcc aaa gaa gtt cca gta ctc cca ata ctt ggt atg ggg gga cta gga Ser Lys Glu Val Pro Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly 340 345 350	1056
aag acg act cta gcc caa atg gtc ttc aat gat caa aga att act gag Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu 355 360 365	1104
cat ttc aat cta aag ata tgg gtt tgt gtc tca gat gat ttt gat gag His Phe Asn Leu Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu 370 375 380	1152
aag agg ttg att aag gca att gta gaa tct att gaa gga aag tca ctg Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu 385 390 395 400	1200
ggt gac atg gac ttg gct ccc ctc cag aaa aag ctt cag gag ttg ttg Gly Asp Met Asp Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu 405 410 415	1248
aat gga aaa aga tac ttt ctt gtt ttg gat gat gtt tgg aat gaa gat Asn Gly Lys Arg Tyr Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp 420 425 430	1296
caa gaa aag tgg gat aat ctt aga gca gta ttg aag att gga gct agt Gln Glu Lys Trp Asp Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser 435 440 445	1344
ggt gct tca att cta att act act cgt ctt gaa aaa att gga tca att Gly Ala Ser Ile Leu Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile 450 455 460	1392
atg gga act ttg caa cta tat cag tta tca aat ttg tct caa gaa gat Met Gly Thr Leu Gln Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp 465 470 475 480	1440
tgt tgg ttg ttg ttc aag caa cgt gca ttt tgc cac caa acc gaa aca Cys Trp Leu Leu Phe Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr 485 490 495	1488
agt cct aaa ctt atg gaa atc gga aag gag att gtg aag aaa tgt ggg Ser Pro Lys Leu Met Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly 500 505 510	1536
ggt gtg cct cta gca gcc aaa act ctt gga ggc ctt tta cgc ttc aag Gly Val Pro Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys 515 520 525	1584
agg gaa gaa agt gaa tgg gaa cat gtg aga gat agt gag att tgg aat Arg Glu Glu Ser Glu Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn 530 535 540	1632
tta cct caa gat gaa aat tct gtt ttg cct gcc ctg agg ctg agt tat Leu Pro Gln Asp Glu Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr 545 550 555 560	1680
cat cat ctt cca ctt gat ttg aga caa tgt ttt gca tat tgc gca gta His His Leu Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val 565 570 575	1728
ttc cca aag gac acc aaa ata gaa aag gaa tat ctc atc gct ctc tgg	1776

WARF0235.ST25.txt

Phe	Pro	Lys	Asp	Thr	Lys	Ile	Glu	Lys	Glu	Tyr	Leu	Ile	Ala	Leu	Trp	
			580					585					590			
atg	gca	cac	agt	ttt	ctt	tta	tca	aaa	gga	aac	atg	gag	cta	gag	gat	1824
Met	Ala	His	Ser	Phe	Leu	Leu	Ser	Lys	Gly	Asn	Met	Glu	Leu	Glu	Asp	
		595					600					605				
gtg	ggc	aat	gaa	gta	tgg	aat	gaa	tta	tac	ttg	agg	tct	ttt	ttc	caa	1872
Val	Gly	Asn	Glu	Val	Trp	Asn	Glu	Leu	Tyr	Leu	Arg	Ser	Phe	Phe	Gln	
	610					615					620					
gag	att	gaa	gtt	aaa	tct	gca	agc	gca	tca	agc	aga	agt	atc	cgc	caa	1920
Glu	Ile	Glu	Val	Lys	Ser	Ala	Ser	Ala	Ser	Ser	Arg	Ser	Ile	Arg	Gln	
625					630					635					640	
ata	aat	gta	aaa	gat	gat	gaa	gat	atg	atg	ttc	att	gta	aca	aat	tat	1968
Ile	Asn	Val	Lys	Asp	Asp	Glu	Asp	Met	Met	Phe	Ile	Val	Thr	Asn	Tyr	
				645					650					655		
aaa	gat	atg	atg	tcc	att	ggg	tct	ccg	aag	tgg	tgt	ctt	ctt	act	ctc	2016
Lys	Asp	Met	Met	Ser	Ile	Gly	Ser	Pro	Lys	Trp	Cys	Leu	Leu	Thr	Leu	
			660					665					670			
ctt	cgc	tct	tta	aaa	ggc	gag	agg	aaa	ggg	tat	caa	ctt	ggg	gaa	cta	2064
Leu	Arg	Ser	Leu	Lys	Gly	Glu	Arg	Lys	Gly	Tyr	Gln	Leu	Gly	Glu	Leu	
		675				680						685				
cga	aat	tta	aac	ctc	cgt	ggg	gca	att	tca	atc	aca	cat	ctt	gag	aga	2112
Arg	Asn	Leu	Asn	Leu	Arg	Gly	Ala	Ile	Ser	Ile	Thr	His	Leu	Glu	Arg	
	690					695					700					
gtg	aaa	aac	gat	atg	gag	gca	aaa	gaa	gcc	aat	tta	tct	gca	aaa	gca	2160
Val	Lys	Asn	Asp	Met	Glu	Ala	Lys	Glu	Ala	Asn	Leu	Ser	Ala	Lys	Ala	
705					710					715					720	
aat	cta	cac	tct	tta	agc	atg	agt	tgg	gat	aga	cca	aac	aga	tat	gaa	2208
Asn	Leu	His	Ser	Leu	Ser	Met	Ser	Trp	Asp	Arg	Pro	Asn	Arg	Tyr	Glu	
				725					730					735		
tcc	gaa	gaa	gtt	aaa	gtg	ctt	gaa	gcc	ctc	aaa	cca	cat	ccc	aat	ctg	2256
Ser	Glu	Glu	Val	Lys	Val	Leu	Glu	Ala	Leu	Lys	Pro	His	Pro	Asn	Leu	
			740					745					750			
aaa	tat	tta	gaa	atc	att	gac	ttc	tgt	gga	ttc	tgt	ctc	cct	gac	tgg	2304
Lys	Tyr	Leu	Glu	Ile	Ile	Asp	Phe	Cys	Gly	Phe	Cys	Leu	Pro	Asp	Trp	
		755				760						765				
atg	aat	cac	tca	gtt	ttg	aaa	aat	gtt	gtc	tct	att	cta	att	agc	ggg	2352
Met	Asn	His	Ser	Val	Leu	Lys	Asn	Val	Val	Ser	Ile	Leu	Ile	Ser	Gly	
		770				775					780					
tgt	gaa	aac	tgc	tcg	tgc	tta	cca	ccc	ttt	ggg	gag	ctg	cct	tgt	cta	2400
Cys	Glu	Asn	Cys	Ser	Cys	Leu	Pro	Pro	Phe	Gly	Glu	Leu	Pro	Cys	Leu	
785					790					795					800	
gaa	agt	ctg	gag	tta	caa	gat	ggg	tct	gtg	gag	gtg	gag	ttt	gtt	gaa	2448
Glu	Ser	Leu	Glu	Leu	Gln	Asp	Gly	Ser	Val	Glu	Val	Glu	Phe	Val	Glu	
				805					810					815		
gat	tct	gga	ttc	ccg	aca	aga	aga	aga	ttt	cca	tcc	ctg	aga	aaa	ctt	2496
Asp	Ser	Gly	Phe	Pro	Thr	Arg	Arg	Arg	Phe	Pro	Ser	Leu	Arg	Lys	Leu	
			820					825					830			
cat	ata	ggg	ggc	ttt	tgt	aat	ctg	aaa	gga	ttg	cag	aga	atg	gaa	gga	2544
His	Ile	Gly	Gly	Phe	Cys	Asn	Leu	Lys	Gly	Leu	Gln	Arg	Met	Glu	Gly	
		835					840					845				
gaa	gag	caa	ttc	ccc	gtg	ctt	gaa	gag	atg	aag	att	tcg	gat	tgc	cct	2592
Glu	Glu	Gln	Phe	Pro	Val	Leu	Glu	Glu	Met	Lys	Ile	Ser	Asp	Cys	Pro	
	850					855					860					

## WARF0235.ST25.txt

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atg ttt gtt ttt ccg acc ctt tct tct gtc aag aaa tta gaa att tgg      2640
Met Phe Val Phe Pro Thr Leu Ser Ser Val Lys Lys Leu Glu Ile Trp
865                               870      875      880

ggg gag gca gat gca aga ggt ttg agc tcc ata tct aat ctc agc act      2688
Gly Glu Ala Asp Ala Arg Gly Leu Ser Ser Ile Ser Asn Leu Ser Thr
                               885      890      895

ctt aca tcc ctc aaa att ttc agt aac cac aca gtg act tca cta ctg      2736
Leu Thr Ser Leu Lys Ile Phe Ser Asn His Thr Val Thr Ser Leu Leu
                               900      905      910

gaa gag atg ttc aaa agc ctc gaa aat ctc aaa tac ttg agt gtc tct      2784
Glu Glu Met Phe Lys Ser Leu Glu Asn Leu Lys Tyr Leu Ser Val Ser
                               915      920      925

tac ttg gag aat ctc aaa gag ctg cct acc agc ctg gct agt ctc aat      2832
Tyr Leu Glu Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu Asn
                               930      935      940

aat ttg aag tgt ctg gat att cgt tat tgt tac gca cta gag agt ctc      2880
Asn Leu Lys Cys Leu Asp Ile Arg Tyr Cys Tyr Ala Leu Glu Ser Leu
945                               950      955      960

ccc gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag tta ttt gtt      2928
Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu Leu Phe Val
                               965      970      975

gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg cag cac cta      2976
Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu
                               980      985      990

aca acc ctc aca agt tta aaa att cgg gga tgt cca caa ctg atc aag      3024
Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln Leu Ile Lys
                               995      1000      1005

cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att tct cac      3069
Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile Ser His
1010      1015      1020

att cct aac gtg aat ata tat att taa      3096
Ile Pro Asn Val Asn Ile Tyr Ile
1025      1030

```

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<211> 1031
<212> PRT
<213> Solanum bulbocastanum

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<400> 20
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Met Trp Leu Ser Thr Phe Pro Thr Ala Leu Ala Val Ala Val Ser Val
1                               5      10      15

```

```
Pro Ser Ser Leu Thr Pro Gln Asp Phe Ser Trp Arg Lys Phe Lys Leu
20      25      30

```

```
Lys Arg Asn Val Lys Ile Ser Arg Asn Phe Glu Phe Ala Ile Ser Cys
35      40      45

```

```
Ser Gly Asp Arg Ala Ala Ser Ile Gly Phe Asp Val Pro Phe Pro Lys
50      55      60

```

```
Asp Tyr Thr Glu Leu Leu Gln Gln Val Phe Ile Leu Phe Ala Phe Ser

```

```

65          70          75          80
Pro Leu Lys Ile Gly Gly Asp Gly Glu Gly Gly Ile Glu Met Thr Gly
      85          90          95
Ser Ile Gln Leu Ile Arg Glu Phe Cys Asp Leu Leu Val Ile Pro Glu
      100          105          110
Lys Ala Thr Lys Thr Arg Ile Phe Phe Pro Glu Ala Asn Glu Val Lys
      115          120          125
Phe Ala Arg Gln Ser Ile Phe Gly Gly Ala Ser Phe Lys Leu Asp Tyr
      130          135          140
Leu Thr Lys Pro Ser Phe Phe Glu Asp Phe Gly Phe Thr Glu Lys Val
      145          150          155          160
Lys Met Ala Asp Arg Val Lys Pro Glu Asp Glu Leu Phe Ile Val Ala
      165          170          175
Tyr Pro Tyr Phe Asn Val Asn Gly Glu Leu Gly Leu Val Phe Gly Phe
      180          185          190
Glu Lys Glu Phe Lys Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala
      195          200          205
Val Leu Glu Asp Ala Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys
      210          215          220
Asn Trp Leu Gln Lys Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile
      225          230          235          240
Leu Asp Asp Cys Lys Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu
      245          250          255
Gly Arg Tyr His Pro Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys
      260          265          270
Arg Met Lys Glu Met Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg
      275          280          285
Arg Asn Phe His Leu Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg
      290          295          300
Arg Gln Thr Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Lys Glu
      305          310          315          320
Lys Glu Glu Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr
      325          330          335
Ser Lys Glu Val Pro Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly
      340          345          350

```



## WARF0235.ST25.txt

Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu  
 355 360 365  
 His Phe Asn Leu Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu  
 370 375 380  
 Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu  
 385 390 395 400  
 Gly Asp Met Asp Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu  
 405 410 415  
 Asn Gly Lys Arg Tyr Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp  
 420 425 430  
 Gln Glu Lys Trp Asp Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser  
 435 440 445  
 Gly Ala Ser Ile Leu Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile  
 450 455 460  
 Met Gly Thr Leu Gln Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp  
 465 470 475 480  
 Cys Trp Leu Leu Phe Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr  
 485 490 495  
 Ser Pro Lys Leu Met Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly  
 500 505 510  
 Gly Val Pro Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys  
 515 520 525  
 Arg Glu Glu Ser Glu Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn  
 530 535 540  
 Leu Pro Gln Asp Glu Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr  
 545 550 555 560  
 His His Leu Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val  
 565 570 575  
 Phe Pro Lys Asp Thr Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp  
 580 585 590  
 Met Ala His Ser Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp  
 595 600 605  
 Val Gly Asn Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln  
 610 615 620  
 Glu Ile Glu Val Lys Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln

625		630		635		640
Ile Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr						
		645		650		655
Lys Asp Met Met Ser Ile Gly Ser Pro Lys Trp Cys Leu Leu Thr Leu						
		660		665		670
Leu Arg Ser Leu Lys Gly Glu Arg Lys Gly Tyr Gln Leu Gly Glu Leu						
		675		680		685
Arg Asn Leu Asn Leu Arg Gly Ala Ile Ser Ile Thr His Leu Glu Arg						
		690		695		700
Val Lys Asn Asp Met Glu Ala Lys Glu Ala Asn Leu Ser Ala Lys Ala						
		705		710		715
Asn Leu His Ser Leu Ser Met Ser Trp Asp Arg Pro Asn Arg Tyr Glu						
		725		730		735
Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro Asn Leu						
		740		745		750
Lys Tyr Leu Glu Ile Ile Asp Phe Cys Gly Phe Cys Leu Pro Asp Trp						
		755		760		765
Met Asn His Ser Val Leu Lys Asn Val Val Ser Ile Leu Ile Ser Gly						
		770		775		780
Cys Glu Asn Cys Ser Cys Leu Pro Pro Phe Gly Glu Leu Pro Cys Leu						
		785		790		800
Glu Ser Leu Glu Leu Gln Asp Gly Ser Val Glu Val Glu Phe Val Glu						
		805		810		815
Asp Ser Gly Phe Pro Thr Arg Arg Arg Phe Pro Ser Leu Arg Lys Leu						
		820		825		830
His Ile Gly Gly Phe Cys Asn Leu Lys Gly Leu Gln Arg Met Glu Gly						
		835		840		845
Glu Glu Gln Phe Pro Val Leu Glu Glu Met Lys Ile Ser Asp Cys Pro						
		850		855		860
Met Phe Val Phe Pro Thr Leu Ser Ser Val Lys Lys Leu Glu Ile Trp						
		865		870		875
Gly Glu Ala Asp Ala Arg Gly Leu Ser Ser Ile Ser Asn Leu Ser Thr						
		885		890		895
Leu Thr Ser Leu Lys Ile Phe Ser Asn His Thr Val Thr Ser Leu Leu						
		900		905		910

## WARF0235.ST25.txt

Glu Glu Met Phe Lys Ser Leu Glu Asn Leu Lys Tyr Leu Ser Val Ser  
 915 920 925

Tyr Leu Glu Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu Asn  
 930 935 940

Asn Leu Lys Cys Leu Asp Ile Arg Tyr Cys Tyr Ala Leu Glu Ser Leu  
 945 950 955 960

Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu Leu Phe Val  
 965 970 975

Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu  
 980 985 990

Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln Leu Ile Lys  
 995 1000 1005

Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile Ser His  
 1010 1015 1020

Ile Pro Asn Val Asn Ile Tyr Ile  
 1025 1030

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 <213> Solanum bulbocastanum

<220>  
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<400> 21  
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 1 5 10 15  
 atc gga gat aaa ctt gta ttg att ttc ggt ttc gaa aag gaa tgt gaa 96  
 Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu  
 20 25 30  
 aag ctg tcg agt gtg ttt tcc aca att caa gct gtg gtt caa gat gct 144  
 Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Val Gln Asp Ala  
 35 40 45  
 cag gag aag caa ttg aag gac aag gca att gag aat tgg ttg cag aaa 192  
 Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys  
 50 55 60  
 ctc aat tct gct gcc tat gaa gtt gat gat ata ttg ggc gaa tgt aaa 240  
 Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys  
 65 70 75 80  
 aat gag gca ata aga ttt gag cag tct cga tta ggg ttt tat cac cca 288  
 Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro  
 85 90 95  
 ggg att atc aat ttc cgt cac aaa att ggg aga agg atg aaa gag ata 336  
 Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile

## WARF0235.ST25.txt

100					105					110						
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Met	Glu	Lys	Leu	Asp	Ala	Ile	Ala	Glu	Glu	Arg	Arg	Lys	Phe	His	Phe	
		115					120					125				
ctt	gaa	aaa	att	acg	gag	aga	caa	gct	gcc	gct	gct	acg	cgt	gaa	aca	432
Leu	Glu	Lys	Ile	Thr	Glu	Arg	Gln	Ala	Ala	Ala	Ala	Thr	Arg	Glu	Thr	
	130					135				140						
ggt	ttt	gtg	tta	act	gaa	cca	aaa	gtc	tac	gga	agg	gac	aaa	gag	gag	480
Gly	Phe	Val	Leu	Thr	Glu	Pro	Lys	Val	Tyr	Gly	Arg	Asp	Lys	Glu	Glu	
	145				150					155				160		
gat	gag	ata	gtg	aaa	att	ctg	ata	aac	aat	ggt	aat	ggt	gcc	gaa	gaa	528
Asp	Glu	Ile	Val	Lys	Ile	Leu	Ile	Asn	Asn	Val	Asn	Val	Ala	Glu	Glu	
				165					170					175		
ctt	cca	gtc	ttc	cct	ata	att	ggt	atg	ggg	gga	cta	gga	aag	acg	aca	576
Leu	Pro	Val	Phe	Pro	Ile	Ile	Gly	Met	Gly	Gly	Leu	Gly	Lys	Thr	Thr	
			180					185					190			
ctt	gcc	caa	atg	atc	ttc	aac	gat	gag	aga	gta	act	aag	cat	ttc	aat	624
Leu	Ala	Gln	Met	Ile	Phe	Asn	Asp	Glu	Arg	Val	Thr	Lys	His	Phe	Asn	
		195					200					205				
ccc	aaa	ata	tgg	gtt	tgt	gtc	tca	gat	gat	ttt	gat	gag	aag	agg	tta	672
Pro	Lys	Ile	Trp	Val	Cys	Val	Ser	Asp	Asp	Phe	Asp	Glu	Lys	Arg	Leu	
	210				215					220						
att	aag	aca	att	ata	gga	aat	att	gaa	aga	agt	tct	cct	cat	gtt	gag	720
Ile	Lys	Thr	Ile	Ile	Gly	Asn	Ile	Glu	Arg	Ser	Ser	Pro	His	Val	Glu	
	225				230					235				240		
gac	ttg	gct	tca	ttt	cag	aag	aag	ctc	cag	gag	tta	ttg	aat	gga	aaa	768
Asp	Leu	Ala	Ser	Phe	Gln	Lys	Lys	Leu	Gln	Glu	Leu	Leu	Asn	Gly	Lys	
				245					250					255		
cga	tac	ttg	ctt	gtc	tta	gat	gat	gtt	tgg	aat	gat	gat	cta	gaa	aag	816
Arg	Tyr	Leu	Leu	Val	Leu	Asp	Asp	Val	Trp	Asn	Asp	Asp	Leu	Glu	Lys	
			260					265					270			
tgg	gct	aag	tta	aga	gca	gtc	tta	act	gtt	gga	gca	aga	ggt	gct	tct	864
Trp	Ala	Lys	Leu	Arg	Ala	Val	Leu	Thr	Val	Gly	Ala	Arg	Gly	Ala	Ser	
		275				280						285				
att	cta	gct	act	act	cgt	ctt	gaa	aag	gtt	gga	tca	att	atg	gga	acg	912
Ile	Leu	Ala	Thr	Thr	Arg	Leu	Glu	Lys	Val	Gly	Ser	Ile	Met	Gly	Thr	
	290					295					300					
tcg	caa	cca	tat	cat	ttg	tca	aat	ttg	tct	cca	cat	gat	agt	tta	ctt	960
Ser	Gln	Pro	Tyr	His	Leu	Ser	Asn	Leu	Ser	Pro	His	Asp	Ser	Leu	Leu	
	305				310					315				320		
ttg	ttt	atg	caa	cgc	gca	ttt	ggg	caa	caa	aaa	gaa	gca	aat	cct	aat	1008
Leu	Phe	Met	Gln	Arg	Ala	Phe	Gly	Gln	Gln	Lys	Glu	Ala	Asn	Pro	Asn	
				325				330						335		
cta	gtg	gcc	att	gga	aag	gag	att	gtg	aag	aaa	tgt	ggt	ggt	gtg	cct	1056
Leu	Val	Ala	Ile	Gly	Lys	Glu	Ile	Val	Lys	Lys	Cys	Gly	Gly	Val	Pro	
			340					345					350			
tta	gcg	gcc	aag	act	ctt	ggt	ggt	ctt	tta	cgc	ttc	aag	aga	gaa	gag	1104
Leu	Ala	Ala	Lys	Thr	Leu	Gly	Gly	Leu	Leu	Arg	Phe	Lys	Arg	Glu	Glu	
		355				360						365				
agt	gaa	tgg	gaa	cat	gtg	aga	gat	aat	gag	att	tgg	agt	ctg	cct	caa	1152
Ser	Glu	Trp	Glu	His	Val	Arg	Asp	Asn	Glu	Ile	Trp	Ser	Leu	Pro	Gln	
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WARF0235.ST25.txt

gat gaa agt tct att ttg cct gct cta aga ctg agt tat cat cac ctt Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu 385 390 395 400	1200
cca ctt gat ttg aga caa tgc ttt gcg tat tgt gca gta ttc cca aag Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys 405 410 415	1248
gac acc aaa atg ata aag gaa aat ctc att act ctc tgg atg gcg cat Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His 420 425 430	1296
ggg ttt ctt tta tca aag gga aac ttg gag cta gag gat gtg ggt aat Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn 435 440 445	1344
gaa gta tgg aat gaa tta tac ttg agg tct ttc ttc caa gaa att gaa Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu 450 455 460	1392
gct aaa tcg ggt aat act tat ttc aag ata cat gat cta atc cat gat Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp 465 470 475 480	1440
ttg gct aca tct ctg ttt tcg gca agc gca tca tgc ggc aat atc cgc Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg 485 490 495	1488
gaa ata aat gtc aaa gat tat aag cat aca gtg tcc att ggt ttc tct Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ser 500 505 510	1536
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tta agg gtg ctt aat cta agt tac tca aaa ctt gag caa tta ccg tct Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser 530 535 540	1632
tcc att gga gat cta tta cat tta aga tac ctg gac ctg tct tgc aat Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn 545 550 555 560	1680
aac ttc cgt agt ctt cca gag agg ttg tgc aag ctt caa aat ctt cag Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln 565 570 575	1728
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aca agt aaa ctt agt agt ctc cga cat ctt gtt gtt gat ggc tgt cca Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro 595 600 605	1824
ttg act tct act cca cca agg ata gga ttg ttg aca tgc ctt aag act Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr 610 615 620	1872
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ctg aaa aac cta aat ctc tgc ggc tca att tca atc aca cac ctt gag Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu 645 650 655	1968
aga gtg aag aac gat acg gat gca gaa gcc aat tta tct gca aaa gca Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala	2016

## WARF0235.ST25.txt

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tat	gaa	tcc	gaa	gaa	gtt	aaa	gtg	ctt	gaa	gca	ctc	aaa	cca	cac	ccc	2112
Tyr	Glu	Ser	Glu	Glu	Val	Lys	Val	Leu	Glu	Ala	Leu	Lys	Pro	His	Pro	
	690					695					700					
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Asn	Leu	Lys	Tyr	Leu	Glu	Ile	Ile	Ala	Phe	Gly	Gly	Phe	Arg	Phe	Pro	
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agc	tgg	ata	aat	cac	tca	gtt	ttg	gag	aag	gtc	atc	tct	gtt	aga	att	2208
Ser	Trp	Ile	Asn	His	Ser	Val	Leu	Glu	Lys	Val	Ile	Ser	Val	Arg	Ile	
				725					730					735		
aaa	agc	tgc	aaa	aac	tgc	ttg	tgc	tta	cca	ccc	ttt	ggg	gag	ctt	cct	2256
Lys	Ser	Cys	Lys	Asn	Cys	Leu	Cys	Leu	Pro	Pro	Phe	Gly	Glu	Leu	Pro	
			740					745					750			
tgt	cta	gaa	aat	cta	gag	tta	caa	aac	gga	tct	gcg	gag	gtg	gag	tat	2304
Cys	Leu	Glu	Asn	Leu	Glu	Leu	Gln	Asn	Gly	Ser	Ala	Glu	Val	Glu	Tyr	
		755				760						765				
gtt	gaa	gag	gat	gat	gtc	cat	tct	aga	ttc	tcc	aca	aga	aga	agc	ttt	2352
Val	Glu	Glu	Asp	Asp	Val	His	Ser	Arg	Phe	Ser	Thr	Arg	Arg	Ser	Phe	
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cca	tcc	ctg	aaa	aaa	ctt	cgt	ata	tgg	ttc	ttt	cgc	agt	ttg	aaa	ggg	2400
Pro	Ser	Leu	Lys	Lys	Leu	Arg	Ile	Trp	Phe	Phe	Arg	Ser	Leu	Lys	Gly	
785					790					795					800	
ctg	atg	aaa	gag	gaa	gga	gaa	gag	aaa	ttc	ccc	atg	ctt	gaa	gag	atg	2448
Leu	Met	Lys	Glu	Glu	Gly	Glu	Glu	Lys	Phe	Pro	Met	Leu	Glu	Glu	Met	
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gcg	att	tta	tat	tgc	cct	ctg	ttt	gtt	ttt	cca	acc	ctt	tct	tct	gtc	2496
Ala	Ile	Leu	Tyr	Cys	Pro	Leu	Phe	Val	Phe	Pro	Thr	Leu	Ser	Ser	Val	
			820					825					830			
aag	aaa	tta	gaa	gtt	cac	ggc	aac	aca	aac	act	aga	ggt	ttg	agc	tcc	2544
Lys	Lys	Leu	Glu	Val	His	Gly	Asn	Thr	Asn	Thr	Arg	Gly	Leu	Ser	Ser	
		835				840						845				
ata	tct	aat	ctt	agc	act	ctt	act	tcc	ctc	cgc	att	ggt	gct	aac	tac	2592
Ile	Ser	Asn	Leu	Ser	Thr	Leu	Thr	Ser	Leu	Arg	Ile	Gly	Ala	Asn	Tyr	
	850					855					860					
aga	gcg	act	tca	ctc	cca	gaa	gag	atg	ttc	aca	agt	ctt	aca	aat	ctc	2640
Arg	Ala	Thr	Ser	Leu	Pro	Glu	Glu	Met	Phe	Thr	Ser	Leu	Thr	Asn	Leu	
865					870					875					880	
gaa	ttc	ttg	agt	ttc	ttt	gac	ttc	aag	aat	ctc	aaa	gat	ctg	cct	acc	2688
Glu	Phe	Leu	Ser	Phe	Phe	Asp	Phe	Lys	Asn	Leu	Lys	Asp	Leu	Pro	Thr	
				885					890					895		
agc	ctg	act	agt	ctc	aat	gct	ttg	aag	cgt	ctc	caa	att	gaa	agt	tgt	2736
Ser	Leu	Thr	Ser	Leu	Asn	Ala	Leu	Lys	Arg	Leu	Gln	Ile	Glu	Ser	Cys	
				900				905					910			
gac	tca	cta	gag	agt	ttc	cct	gaa	caa	ggg	cta	gaa	ggt	tta	act	tca	2784
Asp	Ser	Leu	Glu	Ser	Phe	Pro	Glu	Gln	Gly	Leu	Glu	Gly	Leu	Thr	Ser	
		915				920						925				
ctc	aca	cag	ttg	ttt	gtt	aaa	tac	tgt	aag	atg	cta	aaa	tgt	tta	ccc	2832
Leu	Thr	Gln	Leu	Phe	Val	Lys	Tyr	Cys	Lys	Met	Leu	Lys	Cys	Leu	Pro	
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## WARF0235.ST25.txt

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 Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly  
 945 950 955 960

tgt cca gaa gtg gaa aag cgc tgt gat aag gaa ata gga gaa gac tgg 2928  
 Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp  
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cac aaa att gct cac att cca aat ctg gat att cat tag 2967  
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 <213> Solanum bulbocastanum

<400> 22

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Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Val Gln Asp Ala  
 35 40 45

Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys  
 50 55 60

Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys  
 65 70 75 80

Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro  
 85 90 95

Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile  
 100 105 110

Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Lys Phe His Phe  
 115 120 125

Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Thr Arg Glu Thr  
 130 135 140

Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu  
 145 150 155 160

Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu  
 165 170 175

Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr  
 180 185 190

Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn  
 195 200 205

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Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu
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Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu
225                230                235                240

Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys
                245                250                255

Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys
                260                265                270

Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser
 275                280                285

Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr
 290                295                300

Ser Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu
305                310                315                320

Leu Phe Met Gln Arg Ala Phe Gly Gln Gln Lys Glu Ala Asn Pro Asn
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Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro
                340                345                350

Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu
                355                360                365

Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln
 370                375                380

Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu
385                390                395                400

Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys
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Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His
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Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn
 435                440                445

Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu
 450                455                460

Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp
465                470                475                480

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## WARF0235.ST25.txt

Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg  
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Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ser  
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Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser  
 515 520 525

Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser  
 530 535 540

Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn  
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Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln  
 565 570 575

Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln  
 580 585 590

Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro  
 595 600 605

Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr  
 610 615 620

Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu  
 625 630 635 640

Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu  
 645 650 655

Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala  
 660 665 670

Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg  
 675 680 685

Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro  
 690 695 700

Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro  
 705 710 715 720

Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile  
 725 730 735

Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro  
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Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr  
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Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe  
770 775 780

Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly  
785 790 795 800

Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met  
805 810 815

Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val  
820 825 830

Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser  
835 840 845

Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr  
850 855 860

Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu  
865 870 875 880

Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr  
885 890 895

Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys  
900 905 910

Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser  
915 920 925

Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro  
930 935 940

Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly  
945 950 955 960

Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp  
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His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His  
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## WARF0235.ST25.txt

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ctcttaaata atcctttcat actaatgata aaattttttt tttttttttt tttttactaa 300
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tcaccaaaga aaagggcaaa gatggaaaag aaactaaata ttcattctta actttgaaca 720
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aatattttta acagaaaaat tagatattca aaaactatac aaaaaatatt atacattgca 960
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